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ABSTRACT

This document presents witness' testimonies and supplemental materials from the congressional hearing called to examine the issue of automotive safety. In her opening statement, Chairwoman Patricia Schroeder briefly reviews statistics on traffic accidents and identifies the two major issues to be addressed in the hearing: failure to act by the National Highway Traffic Safety Administration (NHTSA) and the use of safety belts. It is emphasized throughout the hearing that representatives from NHTSA refused to appear at the hearing; the absence of representatives from the trucking and automobile industries is also noted. Witnesses providing testimonies include: (1) Byron Bloch, a consultant on auto safety design, who briefly reviews the history of NHTSA and demonstrates the danger of "windowshade" seat belts (seat belts with too much slack in the shoulder belts), automatic shoulder belts, and truck underride; (2) Joan Claybrook, the president of Public Citizen; who describes safety systems which she feels should be standard equipment in all vehicles; (3) Benjamin Kelley, the president of the Institute for Injury Reduction; who addresses the issue of "windowshade" seat belts; and (4) Brian O'Neill, the president of the Insurance Institute for Highway Safety, who reviews the history of manual and nonmanual automatic restraints and the safeguards in place to prevent truck underride. Letters, prepared statements, and supplemental materials are included from Representative Schroeder, the witnesses, the American Trucking Association, Inc., and Jerry Ralph Curry, from the National Highway Traffic Safety Administration. (NB)

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AUTOMOTIVE SAFETY: ARE WE DOING ENOUGH TO PROTECT AMERICA'S FAMILIES?

ED344151

HEARING

BEFORE THE

SELECT COMMITTEE ON
CHILDREN, YOUTH, AND FAMILIES

HOUSE OF REPRESENTATIVES

ONE HUNDRED SECOND CONGRESS

FIRST SESSION

HEARING HELD IN WASHINGTON, DC, DECEMBER 4, 1991

Printed for the use of the
Select Committee on Children, Youth, and Families

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AUTOMOTIVE SAFETY: ARE WE DOING ENOUGH TO PROTECT AMERICA'S FAMILIES?

WEDNESDAY, DECEMBER 4, 1991.

HOUSE OF REPRESENTATIVES,
SELECT COMMITTEE ON CHILDREN, YOUTH, AND FAMILIES,
Washington, DC.

The select committee met, pursuant to call, at 10 a.m., in room 2118, Rayburn House Office Building, Hon. Patricia Schroeder (chairwoman of the select committee) presiding.

Members present: Representatives Schroeder, Johnson, Peterson and Martinez.

Staff present: Karabelle Pizzigati, staff director; Jill Kagan, deputy staff director; Tim Morrison, chief investigator; Mickey Uelses, investigator; Danielle Madison, minority staff director; Carol Statuto, minority deputy staff director; and Joan Godley, committee clerk.

Chairwoman SCHROEDER. I would like to call the hearing to order and thank you all for being here.

The Select Committee on Children, Youth, and Families feels very strongly that we should be looking at all issues that affect America's families since automotive accidents are the number one killer of all Americans under age 44. We need to do everything we can to reduce the number of deaths on our roadways.

The select committee has started its first in a series of investigative hearings to determine if enough is being done to protect the American family. There are some issues that we will be bringing into focus today that we think are important.

As I mentioned, motor vehicle accidents are the leading cause of death and injuries for Americans up to age 44. Every week the number of children killed in motor vehicle accidents would fill three large school buses, and motor vehicle crashes are the number one cause of the crippling of children in the United States.

We don't bring this up to shock people, but to draw attention to a problem that is made all the more tragic because much of this death is preventable.

There are two things that we want to be talking about this morning. First, in 1966 the Federal Government created what is now known as the National Highway Traffic Safety Administration, NHTSA, in an effort to try to better protect American families from the dangers of driving.

They have made some improvements in automotive safety, but it appears to me that their successes have been few and far between,

and we will have witnesses talk about examples of their failure to act.

We hoped this would be a beginning and we would be getting off to a new start with NHTSA because they have now been authorized in the highway bill that passed Congress in the waning hours.

But that doesn't seem to be the case. Last night they phoned and said, at the last moment they would not come unless they could appear first. I really thought that that was a little late to want to change the order, and we had wanted them to come last so they could respond to why we are even having these hearings, which is that many thoughtful citizens feel they could be doing more. But they wanted to appear first and leave.

As you notice, they have presented testimony as though they would testify, but apparently they are not going to, and the trucking industry followed, saying they too would not come. We felt it was unfair to our witnesses to realign the whole schedule, and we are sorry they could not be here.

One of the interesting things on the table is the news release from the Department of Transportation. One of the things that we will mention today and will be addressed by the witnesses, is the fact that one of the longest—and it must be sitting on yellow paper—one of the longest waiting proposals, 24 years in fact, which is still unresolved is the area of truck underride protection, addressing how easily cars can go underneath a large truck or trailer. It is easily correctable, and has been corrected in Europe. For 24 years it has been debated in this country.

We see this morning that while NHTSA will not be here, they are going to solve this problem with a reflective Bandaid. Their response is that they will put reflective patterns on the back of large truck trailers so that hopefully people will not drive under them. I don't think the reflective Bandaid approach is what this Congress wanted when we called for this hearing, but we will hear more about it.

The other issue that will be addressed today is also being addressed in the media, that of safety belts. General Motors is recalling some of its cars and we salute them for doing that.

Last night there was a wonderful celebration in Washington among people who survived because of air bags, and that was a long, difficult task to get air bags in, but to see all sorts of people who are alive and well because the air bag battle was won makes us want to go forward and make sure that we win some of these other battles that are so important to safety.

I will ask to put the rest of my statement in the record.

[Opening statement of Hon. Patricia Schroeder follows:]

OPENING STATEMENT OF HON. PATRICIA SCHROEDER, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF COLORADO, AND CHAIRWOMAN, SELECT COMMITTEE ON CHILDREN, YOUTH, AND FAMILIES

Pursuant to rule 11 of the House of Representatives, this select committee has the authority to conduct investigations to carry out its responsibility to enhance significantly the capacity of Congress to conduct comprehensive oversight on issues affecting children, youth, and families.

Today, the select committee, in its first in a series of investigative hearings, will be focusing on automotive safety to determine if enough is being done to protect the American family.

The following items will serve to bring the importance of the automotive safety issue clearly into focus:

Motor vehicle accidents are the leading cause of death and injuries for Americans up to the age of 44.

Every week, the number of children killed in motor vehicle accidents would fill three large school buses.

Motor vehicle crashes are the number one cause of the crippling of children in the United States.

I bring up these grim statistics not to shock, but to draw attention to a problem that is made all the more tragic because much of this death is preventable.

For over 25 years, debate has raged on how much can realistically be done to protect the American family from death and injury as they drive the Nation's roadways. Some of the proposed safety devices, such as airbags, were opposed for years by the automobile industry, despite their proven effectiveness.

In 1966 the Federal Government created what is now known as the National Highway Traffic Safety Administration [NHTSA] in an effort to better protect the American family from the dangers of driving. While NHTSA has certainly made some major improvements in automotive safety over the years, their successes have been few and far between. Too often it appears that NHTSA assumes the role of the protector of the automotive industry instead of the defender of the American driving public which it is charged to protect.

Today's hearing will focus on NHTSA's failure to act on two important and long-standing safety issues. The select committee will first focus on the inherent danger associated with two types of seatbelts that are currently in over 50 million cars on America's roads. The more common of the two types, known as "windowshade" seatbelts, routinely introduce too much slack into the belt, greatly reducing the belt's effectiveness in the event of a crash. Contrary to the popular belief that this extra slack would be taken up in an accident, the belt does not retract the excess slack that is regularly introduced from normal usage.

Unfortunately, there are no reliable studies or statistics showing how many people have been killed or seriously injured because of these windowshade seatbelts. Many of these belts automatically retract when the car door is opened, making it impossible to determine whether or not too much slack was in the seatbelt at the time of the accident. In the words of a current automotive safety expert and former NHTSA official, "After an accident, these devices cover their own tracks."

It is ironic that while the American auto industry claims these belts, which are in over 50 million American cars, are safe and reliable, they are not permitted in much of Europe and Australia.

The automotive industry claims that the "comfort and convenience" of windowshade seatbelts are responsible for the dramatic rise in seatbelt usage that has occurred since the mid-1980s. Nothing could be further from the truth. Windowshade devices have been in American cars since 1974. NHTSA conducted a study on seatbelt usage in 1982, when windowshade seatbelts had been on the market for over 8 years, and found that only 10 percent of the drivers were using their seatbelts. It was only with the passage of State mandatory seatbelt use laws in the mid-1980s that seatbelt usage increased, and this was reflected in NHTSA's follow-up study in 1987 which showed that belt usage had increased to 42 percent.

The automotive industry's defense of windowshade seatbelts is made all the more strange by their decision to unilaterally cease using this kind of seatbelt in their cars after the 1991 model year. If these seatbelts were working so well and increased seatbelt usage as they so incorrectly claimed, then why have they stopped using them?

NHTSA's mutating position on the effectiveness of windowshade seatbelts is something which the select committee will examine today. As early as 1974, NHTSA voiced its own concern over the "comfort and convenience" features of seatbelts when it stated that these features had opened the door to "potential loss of seatbelt performance that could result from the addition of comfort and convenience features." Then, in 1979, NHTSA issued a rulemaking which called for the elimination of slack in the shoulder portion of the belt system. However, the proposal was never enacted. Two years later, in 1981, NHTSA issued a final rule on the comfort and convenience issue by stating these kinds of seatbelts would be tested with their maximum amount of permissible slack. However, this "final" rule was delayed for four more years and was then watered down to permit the testing of the windowshade belts with the manufacturer's recommended amount of slack, about one inch, even though much more slack is routinely introduced into the seatbelt system. The National Transportation Safety Board protested this change in the testing procedure,

but their views were ignored by NHTSA. The select committee will be very interested in discussing the reasons for NHTSA's apparent change of heart on this matter.

The select committee will also be examining a proposed rule to require truck underride protection which would prevent cars from sliding under trucks in collisions. This proposal has been languishing at NHTSA for the past 24 years and is still unresolved. Why this rule continues to be stalled at NHTSA is unclear. What is clear is that if trucks had better underride protection, more lives would be saved. It's that simple.

In the late 1960s, NHTSA conducted its own truck underride tests which showed that an effective underride protection was possible, yet, surprisingly, no action was taken. In the late 1970s, the Insurance Institute for Highway Safety also conducted crash tests that proved that effective underride protection was possible. The institute gave the results of their crash tests to NHTSA. However, again, NHTSA did not act.

The question of whether or not a federally mandated, improved underride protection is needed has been argued by the trucking industry and safety experts for too long. Enough is enough. An improved underride protection standard will save lives, is relatively inexpensive, and the technology is in-hand. The Europeans have already proven that addressing this problem is not a problem at all—they've already done it.

It's time that NHTSA, together with the trucking industry, finally put an end to this charade and improve the truck underride protection. The only thing the past 24 years of bickering on the issue has done is to waste precious lives needlessly.

Chairwoman SCHROEDER. Let me yield to the gentleman from South Dakota, Congressman Johnson.

Mr. JOHNSON. Very briefly, I want to commend Chairwoman Schroeder for convening this important hearing. Today we are dealing with an issue that has a consequence of 45,000 fatalities annually, several million in significant injuries, a cost of millions to the economy and that is a source of great concern for every American, particularly of parents. As a father of three children, two adolescent sons in particular, this is a matter of great concern in my family.

I look forward to evaluation of the effectiveness of existing responses to what I regard as a public safety crisis as well as an analysis of what kind of public initiatives are doable and what kinds of consequences we could expect from those initiatives.

I thank the Chairwoman and look forward to testimony today.

Chairwoman SCHROEDER. Our first witness that we have this morning is not a stranger to anyone. She has been out there for a long time working very hard in this area, Joan Claybrook. We have a practice that we swear in all witnesses, if you don't mind.

[Witness sworn.]

Chairwoman SCHROEDER. The floor is yours. We will put your statement in the record, and go for it.

STATEMENT OF JOAN CLAYBROOK, PRESIDENT, PUBLIC CITIZEN, WASHINGTON, DC

Ms. CLAYBROOK. Thank you, Madam Chair. I appreciate the opportunity to be here today.

I must say that it seems to me that this committee should issue a subpoena to call the witnesses from the Department of Transportation and perhaps even from the trucking industry if they refuse to testify. It is almost unheard of that an administration witness would refuse to testify at such a hearing that is focused clearly on the agency's authority.

This hearing asked a question—Automotive safety: Is enough being done to protect America's families. My answer is that with

45,000 fatalities, several million significant injuries at a cost to society of over $300 billion a year, according to the U.S. DOT, the answer must be no.

This is, after all, the equivalent of a major airline crash each and every day of the year. Should that occur, do you think that the FAA would not be here to testify? Do you think the American public would put up with this? Do you think the President would be worried about it? Of course.

This is a grave concern to the families of America and one which deserves as much congressional attention as we can give it.

Last night there was a wonderful event in which families described what it was like to be in a car crash and to survive because of the air bag. They told their stories. Some cried as they remembered the horror of the crash and how grateful they were to the engineers and inventors who had initiated this safety device. The air bag, this technological vaccine, is also in cars because of the regulatory system we have, the work of the NHTSA in mandating the standard albeit several different times in order to finally achieve it after a Supreme Court ruling.

Some auto companies have offered passive belts for sale to meet the standard, but the superior performance and convenience and popularity of air bags with manual belts has made the air bag much more popular and companies have offered them most recently in their cars. Now every company will do this because of this new law which actually mandates that by the mid-1990's all cars, vans and trucks have the systems.

When fully in effect, the standard will save 12,000 lives a year and reduce over 200,000 injuries. It is incredible what the payoff is from this one standard alone.

There are other safety systems which should be standard equipment in all vehicles and that would save thousands of lives a year as well. Among them are items that are the subject of the hearing today. However, the likelihood of this happening any time soon I believe is small because the regulatory system and authority of the agency, NHTSA, is often preempted by the Office Of Management and Budget, by the Quayle Council on Competitiveness and by the general philosophical objection by this and the prior administration to issuance of safety standards.

As a result, a number of key programs have been discontinued. The agency's tiny budget was severely cut in the 1980s and never restored. The Vehicle Research program is years behind previous plans, and thus the regulatory agenda takes many years more than it should to be accomplished.

This agency is one of the most important of our government agencies because its mission is clear and successes are enormous, to save lives and reduce injuries in auto crashes. The vast majority of the public strongly favors the agency's purposes, because everyone wants the safest car possible. But often the safety advances come first in small numbers in some luxury cars, the rich benefit, everyone else doesn't.

Safety should not be the preserve of the rich, and that is the democratic mission of this agency. It is to take the best technology and make sure it is available to all of us.

The public knows that safety designed into cars is the most important thing. The Bandaid decision is a good example. There was an analysis done by Dr. William Hadden, the agency's first Administrator, who helped us better understand the sequence of auto crashes—pre-crash, the crash and post-crash. This is a pre-crash standard; that is, it helps drivers do a better job of meeting their obligations on the highway.

We have learned that the crash worthiness standards, those that work automatically such as the air bags, the crash worthiness design of the car, the built-in padding and vehicle underride guard built into the truck operate automatically, so they are much more effective than any other standards. That is not to demean the other standards; for instance, lighting is very important, but it is not enough. It should be done in combination with a vehicle underride guard.

This agency has been buffeted and pushed and underfunded and understaffed. Some of the most important research programs have been jettisoned. Even its dedicated staff often gets discouraged as they witness the snail's pace of programs.

With a budget of a little over $100 million a year, one-fifth of the cost of a Stealth bomber, its safety accomplishments far outrival those of the so-called Defense Department at a tiny fraction of the cost.

Congress has been instrumental over the years in pushing this agency and in assisting in getting its mission accomplished. The Appropriations Committees in the House and the Senate have conducted vigorous oversight and increased the budget beyond what has been requested by the Administration, but there have been few hearings of this sort, hearings that focus on particular rulemakings such as the truck underride guard, the belt windowshade device or failing seat backs.

I think it is magnificent that you are doing these hearings and bringing public attention to them.

I would like to add another item to your agenda, the area of pedestrian safety. Forty percent of children killed are pedestrian fatalities. There are something like 6,500 to 7,000 of our 450,000 fatalities every year are pedestrians, and cars are not designed to be forgiving to pedestrians when they interact.

The car can be designed to remove the sharp edges, the hood area could be designed to be energy absorbing so it becomes almost a basket holding the pedestrian onto the hood and not shooting them onto the highway and causing injuries. This is an area the agency has been working on for 15 years, like other areas.

An actual proposed standard was issued in the early 1980s, and nothing has happened since. We believe the agency is going to jettison this area and abandon any work on it. The Appropriations Committee has required a study to be done by the agency to be submitted next spring, and our hope is that this will at least push the agency to some extent to continue in this area.

It is a fact that people who are injured as pedestrians are much more severely injured than occupants. Head injury and brain damage is likely, and it is an area for attention.

My role here today as a former administrator of this agency is to say thank you for holding these hearings, for bringing experts here

to talk about the particular facts that underlie the areas that you are focused on.

On behalf of myself and Public Citizen and Advocates for Highway and Auto Safety, which I cochair, we are available to help you in any way that we can.

I would like to submit for the record some additional items that might enhance it.

Chairwoman SCHROEDER. Without objection, we would be more than happy to have them.

[Prepared statement of Joan Claybrook follows:]

PREPARED STATEMENT OF JOAN CLAYBROOK, PRESIDENT,
PUBLIC CITIZEN, WASHINGTON, DC

Thank you for the invitation to testify this morning on the topic, "Automotive Safety: Is enough being done to protect America's families? With 45,000 fatalities and several million significant injuries each year in auto crashes, at a cost to society of over 300 billion dollars according to the U. S. Department of Transportation, the answer to this question must be no. Without question, American families are deeply affected in the most personal ways by auto crashes.

Last night the impact of auto crashes on the American familiy was vividly described by 11 airbag crash survivors and their families at a dinner initiated by Ralph Nader to honor 11 of the most important inventors and early developers of the airbag. The survivors told the story of their crash, about how it had affected their family, how seriously they would have been injured without an airbag, and how grateful they were to the engineers and inventors who made the airbag a reality and allowed

them to walk away from their crash.

The airbag is also a reality because the U.S. Department of Transportation's National Highway Traffic Safety Administration (NHTSA) issued a standard mandating automatic crash protection (airbags or automatic belts) in all cars by model year 1990 (the effective date of the first such standard was 1974, then 1982, and finally 1990 following a unanimous 1983 decision by the U.S. Supreme Court overruling the Reagan Administration revocation of the 1982 standard).

Some auto companies have offered passive belts, but the superior performance, convenience and popularity of airbags with manual belts pushed many companies to offer airbags instead. But now every company will do so in the next few years because just last week the Congress passed a new auto safety law that mandates a number of rulemaking actions to save thousands of lives annually, among them one requiring airbags in the full front seat in all cars by the mid-1990's and in all vans and light trucks shortly thereafter. When fully in effect in all these vehicles, this safety standard will result in saving 12,000 lives and mitigating over 200,000 severe injuries each year!

There are many other safety systems in addition to the airbag which should be standard equipment in all vehicles because they would save hundreds if not thousands of lives each year. Among them are the items which are the subject of the hearings before this Select Committee. However, the likelihood of this happening anytime soon is small because the regulatory authority of NHTSA is now often preempted by the Office of Management and

Budget, by the Quayle Council on Competitiveness, and the general philosophical objection of the Reagan/Bush administrations to issuance of safety standards. As a result, a number of key programs have been discontinued, the agency's tiny budget that was severely cut in the early 1980's has never been restored, the vehicle research program is years behind previous plans, and thus the regulatory agenda takes years longer than necessary to complete.

The NHTSA is one of the most important of our government agencies. It's mission is simple and clear: to save lives and reduce injuries in auto crashes. The vast majority of the public strongly favors the agency's purposes. Everyone wants the safest car possible. But often safety advances, when voluntarily supplied by the auto companies, appear only on luxury cars. Safety should not be the preserve of the rich. It should be built into every car. That is the democratic mission of the NHTSA.

And that is why this agency's mission is so popular. The public now knows that vehicle design and performance in crashes plays a major role in determining levels of injury. Yet this small agency, which has been more cost effective and saved more lives than just about any other government function, is grossly underfunded and understaffed, some of its most important research programs have been jettisoned, and even its most tenacious and dedicated staff get discouraged as they witness the snails pace of progress. With a budget of less than $100 million a year, or about one-fifth of the cost of one stealth bomber, its safety

accomplishments far outrival those of the so-called Defense Department at a tiny fraction of the cost.

The Congress has been instrumental over the years in pushing and in assisting NHTSA to accomplish its purposes. The appropriations subcommittees on transportation have conducted vigorous oversight, sought significant reports on the agency's policies and activities, and increased its budget over the objections of the Administration. But there have been few general oversight hearings, and none focused on truck underride guard, the belt windowshade device or failing seat backs, the subjects of your hearings. And there is more that deserves attention.

Of particular importance to children and families is pedestrian safety. Almost half of the child highway fatalities are pedestrians. And pedestrian injuries are usually very severe, often involving brain damage from head injury. The NHTSA has shown in its research that because many pedestrian crashes occur at speeds of 20 mph or below, when cars are designed to be much more forgiving to pedestrians, and sharp points and edges are removed and the hood area is softened to absorb the energy of the crash, pedestrian injuries can be significantly reduced.

Holding public hearings and gathering information from government, industry and private groups on these important safety issues can be a critical spur to focus public attention and agency energy on them. We thank the committee for taking the time and energy to investigate these issues. On behalf of myself, Public Citizen, and Advocates for Highway and Auto Safety which I co-chair, we stand ready to assist you in any way possible.

Chairwoman SCHROEDER. Your perspective is a very interesting one. One of the things that troubles me, is that it seems that for the last 12 years we have had administrations that felt that if we did anything about safety, we would really be harming the competitiveness of the American automotive industry. Yet when I see TV ads, I see babies sleeping in tires and kids and people who survived because of air bags—and saying get an air bag, protect your family—why this conflict?

Why do the commercial writers think that that is salable and yet the administration thinks it isn't? I am confused. Are there any statistics showing that that is the last thing that people shop for?

Ms. CLAYBROOK. The studies show that people are very, very interested in safety when they buy a car, and I think the advertising has enhanced that. For many years there was a presumption that safety doesn't sell. The myth came out of an advertising program initiated in 1956 by Ford Motor Company in which MacNamara, then president of Ford, decided to push safety. It was a year when General Motors had newer model cars and outsold Ford, and there developed the myth that safety doesn't sell as a result.

The first people who ordered seat belts, the number of orders for seat belts, far exceeded what they expected. So it wasn't that safety doesn't sell. That is a myth. It continued until the early 1980s, and finally the issuance of the air bag passive restraint standard forced these companies to put the systems in the cars and then they had to sell them.

One of the most important things that happened during the course of this was the decision of Lee Iacocca to put all air bags in their cars rather than some belts and some bags. Then he had to sell them and decided to try to take advantage of this decision and it was a major factor in changing industry behavior in selling safety.

If the companies are selling safety, do they really want safety and what are they saying behind the scenes to the Administration. They are saying let's not have any more regulation. The industry has never wanted regulation.

Most standards are minimal. They are supposed to be minimum safety standards and institutionalize the state of the art.

Mercedes, Volvo, BMW put these safety systems in their vehicles way ahead of the issuance of the standards, or at the most a year or two ahead. It is not like there is a lack of feasibility or difficulty or excessive cost to these requirements, but the industry doesn't like them.

I think behind the scenes they are asking the administration not to issue any more safety standards.

Chairwoman SCHROEDER. The committee will look into issuing subpoenas. I think it is ridiculous that trucks are able to drive up and down the highway—NHTSA is funded with Federal money and it is to protect the taxpayer—yet they don't want to answer questions—what I heard you saying about their response this morning that their reflective Bandaid response, is that it is helpful and helps visibility and so forth, but it is not the whole thing?

Ms. CLAYBROOK. That is correct. I think you need a vehicle underride guard on large trucks. The agency has been working on this issue since the 1960's and concluded in the early 1970s under

the Nixon administration not to issue a standard proposed. Another was proposed in 1981 shortly before I left office.

What has happened during this period of time is that the technology has vastly improved for underride guards and excellent systems are available that weren't available in the 1960's, but are available today and are used widely in other countries. I think that the agency's estimates of the life saving are very conservative and the systems are much less costly and much more efficient than they ever used to be.

One of the issues is how much energy can be absorbed so you actually protect the occupants. It is not just that the car doesn't go totally under the truck, but how much energy can be absorbed so the occupant can survive.

The capacity is improved as well with the new underride systems themselves, and the agency ought to analyze the combination because all cars will have air bags in them by the time any standard issued today for a vehicle underride guard takes effect.

Chairwoman SCHROEDER. If the technology is there and this is an agency not beholden to the industry, why do we have a Bandaid solution rather than a real solution? What is the fear? Is this all that costly, or what is the problem with moving on it?

Ms. CLAYBROOK. I think that the trucking industry has opposed this for many, many years. Since 1970 they have actively opposed this standard. I think this administration is very responsive to the industry, no question about it. What is sad to me is that this should not be a political issue. Safety should not be a political issue, it should be an issue looked at on its merits.

Unfortunately, this Administration is very close to industry and looks at it politically rather than substantively. There is a philosophical resistance to standards, and that hurts people.

Chairwoman SCHROEDER. In other countries that have something like NHTSA, they don't seem to be as beholden to the industry?

Ms. CLAYBROOK. They offer aid differently. There is more of a collegial relationship in European and Japanese countries, where they negotiate. NHTSA has more authority than any other government regulatory agency in the automotive field, authority to submit information, authority to do research, and has enormous scope of authority and capability, but it hasn't used it. I think that that is the answer.

Chairwoman SCHROEDER. And it seems to take safety rules and let them age, almost like a winery rather than an agency?

Ms. CLAYBROOK. I will say that the agency's budget for the quality of research that is required to issue these standards is very tiny and the number of engineers is de minimis; it is tiny.

This agency has been buffeted and its budget has been kept tiny from the first day it was started. It was started in the middle of the Vietnam war and everybody said we have to save money because of the Vietnam war, and its budget started small. The starting point is what you measure against, but it has a very small budget and has complicated and expensive research to do. No question in my mind that that has been one of the factors.

But OMB has never allowed it to request a significant budget.

Chairwoman SCHROEDER. We always find that OMB is interfaced between any agency that comes up here. We call it kissing through a picket fence. You can never find out what is needed.

Congressman Johnson, do you have any questions?

Mr. JOHNSON. Ms. Claybrook, you have testified about the importance of the National Highway Traffic Safety Administration, NHTSA, and alluded to its failings as well. There is going to be further testimony later on this morning that is going to be severely critical of NHTSA relative to their unwillingness, apparently, to address seat belt safety standards, truck underride protection, and their virtual some would contend surrender of vehicle safety performance standards to the industry itself.

You have described some of the underfunding problems that NHTSA has gone through, but can this agency be returned to its original purpose and to its original strength through congressional action, through the steps that we can take, or is it simply dependent on greater leadership from the White House and more direction from the Administration to free this agency to do its mission?

Ms. CLAYBROOK. I think that both is the answer. There is nothing to replace leadership. That is the most important issue. Determination and a sense of mission and a desire to lead this agency—there is nothing to replace that. It simplifies everything.

The Congress last week after seven years passed a magnificent bill that has a lot of mandatory dates in it, and it is something that I commend the committee to look at and to consider having oversight hearings on. That legislation requires all air bags by the mid-1990's, requires issuance of a head injury standard to protect heads in crashes, the structure of the car.

It requires issuance of roll over prevention standards, something that Senator Tim Wirth, when chairman of the subcommittee in 1986, petitioned the agency to do when he was a Member of the House. The agency refused to do it. It is now mandated.

A requirement for child booster seats—there is no safety standard for children between age four and eight. They outgrow the child restraint and don't fit into the larger belts. They have to do a rulemaking on that, and on adjustable belts so they can adjust up and down. That is in a number of cars now, in the Honda Accord, yet not in most cars. That is important for children.

It requires anti-lock brakes in all cars. It requires a rulemaking proceeding in trucks. It has a deadline specifically telling the agency when they have to act. The Congress in this legislation has attempted to supplement the lack of leadership and set an agenda for the 1990's with specific deadlines in a way to overcome the resistance of the Office of Management and Budget, who cannot in the face of these statutory deadlines refuse to allow the agency to put these standards forward. They can issue do-nothing standards perhaps. That is where I think the oversight of the Congress could play an important role.

Mr. JOHNSON. I yield back.

Chairwoman SCHROEDER. Thank you very much. We appreciate you kicking this off and getting this going.

The record will be open for two weeks, so as people see things that we should add, subtract or whatever, let us know. We appreciate your vigilance in this area.

Chairwoman SCHROEDER. Our next witness this morning is a consultant in safety design from Potomac, Maryland, who is going to tell us if this is possible.

[Witness sworn.]

Chairwoman SCHROEDER. The floor is yours. We will put your entire statement in the record and we welcome you.

STATEMENT OF BYRON BLOCH, CONSULTANT, AUTO SAFETY DESIGN, POTOMAC, MD

Mr. BLOCH. Thank you very much. I welcome the opportunity to come before your committee, the Select Committee on Children, Youth, and Families. With that spirit in mind and also for them to observe our American democracy in action this morning, I did bring with me my wife Naomi and my daughter Andrea, my son Brandon and my daughter Candice, and they are seated here to witness democracy in action.

Before I formally begin my comments, I did want to point out that as you had mentioned, neither the representative from the National Highway Traffic Safety Administration, NHTSA, no one from NHTSA is here this morning though they were invited and apparently initially were going to come but changed their mind. Nor is there anyone from the trucking industry or from the auto industry.

Among the tragedies of the lost lives and injuries that occur in these accidents is the tragedy of the unwillingness of our government auto safety agency to willingly appear before this committee and to respond to questions and to present testimony.

I think it is a very sad day that America's corporations, General Motors, Ford, Chrysler, the trucking association and the truck and trailer manufacturers—they are conspicuous by their absence. They should be here, and we should all cooperate in trying to save lives.

It is not a matter of us against them, or safety advocates against the corporate interests. We all have parents, we all have fathers and mothers and children and sisters and brothers, and no one, whether they are part of a corporate family, part of a consumer advocate family, part of a congressional family, no one deserves to be needlessly killed, murdered in a car crash when they could have and should have survived.

No one deserves to be paralyzed or burned or put into a coma for the rest of their lives. It is in that spirit that I believe they have done a disservice to the American public by not being here today.

As I mentioned, I do appreciate this opportunity to be here. My perspective is from the viewpoint of having been in the trenches in auto safety for close to 25 years as an independent consultant in auto safety design. I have evaluated what happens in many car accidents, many collision accidents involving passenger automobiles, pick up trucks, vans, large trucks and even school buses.

And over the years, Mrs. Schroeder, I have met with the victims, some burn victims with melted faces and no hands, some of the parents whose children are in comas for the rest of their lives, and I have met with quadriplegics who wish they could do something,

even like eating a dinner or writing something. Their mind is alert but their body is paralyzed for life.

This is not just a technical subject. This is a human tragedy and human life and death kind of subject that I believe we are here for today. I think we should keep in mind that the needless victims of the collision accidents where these injuries could have been preventable, they are really here with us too.

Though they are not sitting at the table testifying, we should not lose sight that nursing homes around America, private residences, throughout this country, there are millions of people who have been injured because we have not had air bags, have not had truck underride protection, because we have had mediocre second-rate seat belts when we should have had the best, when we have seats that collapse, roofs that crush needlessly when vehicles roll over, and the list goes on and on.

When I first began this career in auto safety it was in the 1960's. I thought, I will be involved with auto safety for ten years or so and the cars will become so safe that I will move on to other professional endeavors. It is now a quarter century later, my hair is getting less and grayer.

This is the first time I have testified to a committee wearing glasses, and time ticks along. But sadly, the cars and trucks could be a lot safer and we are moving too slowly.

With regard to NHTSA, just one point. I have been following NHTSA since before it was born. I reviewed the original congressional hearings chaired by Senator Robert F. Kennedy and Senator Abraham Ribicoff and the promises made by the car companies to maximize efforts and to be open to the public—those were shallow promises in the mid-1960's.

When NHTSA was born, I came from California, where I lived, and visited NHTSA regularly over the years. I was perhaps known for my dashing through the rather stark-looking halls of NHTSA seeking information about how to prevent injuries and how our vehicles could be made safer, and then I would go back to California.

I have seen the political administrations inhibit NHTSA with tragic consequences. In the Johnson administration under Dr. William Haddon, NHTSA got off to a good start. Then came the Nixon administration and thanks to secret White House meetings, particularly with then Ford, President, Lee Iacocca and Henry Ford urging President Nixon to do something about the regulations because as Mr. Iacocca said safety is killing our business. And the head rests and shoulder belts are complete wastes of money, said Mr. Iacocca in 1981.

As a result of those secret White House meetings, President Nixon put out a directive to the Secretary of Transportation which effectively postponed, put on the shelf many, many motor vehicle safety regulations that would instead had they been put into effect, would have saved many lives throughout the 1970s.

Those standards were delayed and weakened and killed, not for technological reasons or practicality reasons, but for political gamesmanship through secret White House meetings. And that was not just a rare occurrence. Let me continue briefly, on that one subject if I may.

Things started to get back in shape. President Carter was elected in the late 1970s and appointed Joan Claybrook, who we heard this morning from her wonderful base of knowledge and expertise as the former Administrator of NHTSA. She tried to get many of these programs reinstituted and we were at the brink of many of these about to take place, truck underride, air bags, a lot of the safety developments that had languished through the 1970s.

By 1981, when President Reagan got elected, his administration put a stop by the philosophy of deregulation. So the 1980s continued with virtually nothing being done under the NHTSA administrations of Raymond Palt and Diane Steed.

We are into the 1990's and at the end of the political delays caused particularly in the Nixon and Reagan administration. We are now on the threshold mostly through the efforts of your good hearings and what Congress can do to move ahead and make our vehicles as safe as they could have been over the last 20 years but for these political interferences and delays.

The two subjects that I have been invited to particularly address are seat belts in the cars, what is called the "windowshade" seat belt, whereby when you put on the seat belt and drive along, the shoulder belt loosens. That seat belt is then too loose to effectively prevent serious or fatal injuries in a car crash.

I have a video portion to show you. [Video begins.]

Here you see me driving a General Motors car wearing the "windowshade" seat belt. In the space of one block from a snug belt, merely by reaching over to the radio and toward the glove compartment, you will see the slack that has been put into the shoulder belt.

The tragedy of it is because of that looseness the belt doesn't fit properly across my torso, and it could slip off my shoulder. I am not putting the slack in. It occurred inadvertently. In a crash I would go forward and impact my face and chest into the steering wheel or into the windshield. [Video pauses.]

Chairwoman SCHROEDER. I thought those retracted and locked?

Mr. BLOCH. No. When the slack is in the seat belt, which is in tens of millions of cars produced by General Motors and Ford and Chrysler throughout the 1970s, the misconception is that in a crash, the belt will snug to your body. If you have slack in the shoulder belt and the crash begins, you are beginning with six to eight inches of slack, so the belt will not restrain you.

It is almost a fraud to refer to it as a slack in the belt. That was originally called a comfort and convenience tension relief feature. The industry came up with that, particularly General Motors, as a way to try to encourage more people to buckle up rather than having them feel the pressure along their body or having the belt chafe along their neck.

Those problems could have been solved by building the seat belts into the seats, but then the car companies would have to make strong seats for a change, and because of reluctance to do that they could not integrate the seat belts into the seat.

NHTSA did a very limited test study, and you see it here. [Video resumes.]

There is a right front seat test dummy, no driver dummy, and this is the extent of NHTSA testing of slack in the shoulder belt.

This is with no slack and you will see that the test dummy is restrained from what would have been otherwise a severe injury. With two to four inches of slack you will have a probable injury, and with full amount of slack in the belt you will be killed. NHTSA was aware of that——

Chairwoman SCHROEDER. Where were these tests conducted?

Mr. BLOCH. I am not sure of the contractor, but it was under a research project for NHTSA. I believe they were done in the late 1970s.

I am sorry, they were conducted in 1982. This was some years after NHTSA had already permitted the car companies to have the slack inducing windowshade belts.

Let me finish on the windowshade belt. It is interesting. I went through the owners manuals that General Motors, Ford and Chrysler provided to the consumers to alert them of the dangers of too much slack in the shoulder belt.

That is in my testimony in more detail. But virtually none of the warnings until very recently tell you that your life is at risk and that you could be severely brain damaged or killed if there is too much slack in the shoulder belt.

One of the proposals I have is that the committee request of NHTSA or mandate NHTSA to have a warning label for windowshade seat belts. I put that in my testimony on page 6. The language is a slight extension of language that is in NHTSA's own documents about the hazards of seat belts with too much slack.

For the record, the warning label should include language something like this

SAFETY WARNING: This vehicle is equipped with seat belts that can cause too much slack or looseness in the shoulder belt even during normal driving. You can be severely or fatally injured if the belt is too loose (more than one inch of slack). Please periodically check to make sure the shoulder belt fits you snugly, as it will not automatically tighten in a crash. The lap belt should also fit snugly.

Those warnings are not in our cars. You have to look very diligently through the owner's manual if you still have one with your car after two or three years, to find even anything approaching a warning or a caution about too much slack in the shoulder belt.

I believe that General Motors, Ford and Chrysler should immediately send out two warning labels to all of the registered owners of their cars that have windowshade seat belts, and those warning labels should be permanently fastened with permanent adhesive to the sun visors in those cars.

There is precedent for this. When Ford Motor Company was having a lot of complaints about accidents caused when their so-called automatic transmissions were jumping from park to reverse, NHTSA allowed Ford Motor Company to send out I believe something like 16 million warning labels that you the consumer were supposed to put on your sun visor to tell you to make sure that the transmission was in park and that you set the parking brake.

If it was good enough for the transmission problem, why isn't it good enough to send warning labels to consumers who are unaware that the windowshade slack inducing seat belt can kill them unless they keep it snug at all times? I think a warning label is in order. A recall campaign would be better, but I don't think we can force

them to recall 30 million cars and force them to put in safer seat belts that they should have put in in the beginning.

Secondly, if I could continue with the video briefly, I am going to show you the automatic shoulder belt. [Video continues.]

See how it automatically comes around you. This is the car-mounted one. The prior one was the motorized mouse.

The tragedy of that is it is really not so effective to wear just the shoulder belt. You have to always remember to put on the lap belt. A recent survey by the University of North Carolina pointed out that less than 30 percent of the American public whose cars had automatic shoulder belts even remembered to buckle up their lap belt, and many were not even aware that you are supposed to.

How important is it to put on the lap belt? I say it is life and death. You must always remember to buckle up your lap belt. It is ludicrous that they call it an automatic belt system. It should be called a half automatic belt system, but I don't think that would satisfy the manufacturers.

It is not just myself who believes that way. I quote from an eminent authority, General Motors—in a car that took General Motors over $3 billion dollars to develop over an eight-year period to be a car that would show American leadership in small car technology. At long last General Motors, the "mark of excellence," came out with a car called the Saturn and, lo and behold, what do you think the superior safety restraint technology was after laboring for eight years and $3 billion?

In the Saturn, General Motors put in an automatic motorized shoulder belt and you still have to remember to put on your lap belt, and there is no air bag. It is not even available in the Saturn.

I went and got a sun visor. I ordered one from my friendly local Saturn dealer. I will show you, Mrs. Schroeder, the side you see when you are sitting in the passenger seat. It says "CAUTION—Fasten lap belt. See back of visor for more details."

So before you drive away, you flip down the sun visor and read the caution that General Motors has seen fit to tell the owners of 1992 Saturns. It says "caution" with an exclamation mark, "Not wearing your lap belt increases the chance of severe or fatal injury in an accident. The shoulder belt alone may not restrain you in all accidents. Always fasten your lap belt in addition to using the automatic shoulder belt."

So here is General Motors telling you that the belt they put in their brand new super-duper Saturn is woefully inadequate and can kill you. It says fatal injury in an accident unless you remember to put on the lap belt. I think General Motors is making a mockery of what the available technology is to protect the American consumer, when they go through such mediocre technologies as the one I just discussed.

In conclusion, on the seat belt issue I think there should be a warning label, and I put an example on the easel, the warning label for the automatic shoulder belt is the top one. What I really did, Ms. Schroeder, so General Motors and the auto industry could not object to it, was that I used their own language.

I say require NHTSA to have the auto companies send out warning labels to all cars sold in America that have automatic shoulder belts only because, if it was good enough for General Motors to fi-

nally issue this kind of warning for the driver and passengers of the Saturn with automatic shoulder belts, then why shouldn't all the car companies, foreign and domestic, that put in automatic shoulder belts over the past seven years or so also have such a warning?

Finally, the third subject is truck underride. [Video continues.]

Let me show you the tragedy of truck underride. That was part of a film produced by the Insurance Institute for Highway Safety which continues to do a marvelous job of alerting the public and Congress and NHTSA to dangers on our highway. You can see the kind of crashes.

Let me stop at an appropriate point to show you the underride guard, a typical one, as you see there. There you can see all that there is a so-called guard that the trucking industry says is there. It came out in the 1950s. That is 40 years ago. They came out with one, and the only requirements are that it be no higher than 30 inches above the ground and that it be strong and adequately attached to the vehicle. That is it.

There is no crash test requirement. It is, of course, much too high off the ground to prevent severe and fatal crashes when cars go beneath the rear of those trucks. This is just an overview thanks to the Insurance Institute for Highway Safety. This is some overview of highway accident footage to show the level of tragedy that could occur.

Many of us can recall that actress Jayne Mansfield was killed when the car she was in went below the rear of a large truck in New Orleans. This is part of a NHTSA study done in the early 1960s and late 1970s. You can see how a more effective underride guard prevents the underride accident. Now that is not in production. That is just an example of what could and should have been done.

This is in 1970. NHTSA, of course, was aware of this. This was part of their project. The car companies also did crash tests. This is General Motors. The Chevrolet Camaro is trying to get under the rear of a truck. Thanks to stronger guards, that tragedy is prevented.

Let me show you some film from the Insurance Institute for Highway Safety, they did a series of crash tests. This is in 1976, a Chevrolet Chevette at 29 miles an hour. Look what happens to the passenger compartment as the small car underrides the rear of a tall truck. That has the typical guard that you see today. And you can see how ineffective it is in preventing the intrusion into the occupant's survival space.

This is a view from inside the Chevrolet Chevette. This would result in an extremely severe or fatal injury, obviously. Not only were Chevettes crash tested, but the next ones were Ford Granadas. At 33 miles an hour, look what happens to the occupants as the car continues beneath the rear of the trailer unit. You can see how the occupants would be severely brain damaged or killed or decapitated as has happened in some of the accidents.

You can see what happened to that passenger as the rigid, strong rear of the truck impacts into their head. I have over the years consulted in accident cases. I know victims and families of victims of truck underride crashes. It happens in the real world.

This is a Chevette with an improved underride guard. Look at the remarkable difference when you have the underride protection at the rear of the truck. Notice how it prevents the car from entering. These underguards should be energy absorbing also. They should absorb energy as the car crashes into them so the occupant can ride down the crash over a longer distance.

This driver and passenger obviously with an air bag would walk away or certainly survive this kind of crash. Now the Ford Granada at 34 miles an hour. Again the penetration is significantly reduced because of an underride guard. There is a brief bit more to this and then we are through with the underride section.

With a good seat belt and especially with a good seat belt and an air bag, these accidents would be survivable if the underride guard were also on the back of the trailers and trucks.

In Europe they have had standards, in Sweden since the 1970s, in England since 1983 they have had underride guards. This is a typical underride guard that you will find in Europe. You will notice it is an energy absorbing design. You will see when the car is pulled back, the guard restores itself more to the original position.

NHTSA did fund, under the very capable administration of Joan Claybrook, they did fund a $570,000 level of crash tests and other tests. This is one of them where a Volkswagen Rabbit is shown with regards to a 22-inch guard. This is a key point here. This is a 22-inch guard.

I want to call your attention to this for a reason because the current NHTSA proposal, or at least the rumored current NHTSA proposal that may be issued soon, we hope, talked in terms of a 22-inch height for that underride guard. That is much too high. It should be 18 inches preferably and certainly no more than 20; 18 inches would protect the occupants of the smaller and compact size cars which are 20 to 25 percent of the cars that we are going to see on the highways over the next few years if and when underride guards are even put into effect.

So we have to tailor underride guards for that 18 inch level. You will see at that 18 inches the axle structure and the majority of the engine is overridden. Now this is another angle. The bumper and support structures are overridden, the front wheel and axle is overridden and the engine is merely tipped backward. That is why the 22-inch guard is wrong.

Yet that is the current NHTSA thinking. So even if they go ahead with an underride guard, it will be inadequate.

This is a case I consulted in, where the man was decapitated when his Honda Accord went beneath the side of a trailer. This is the vehicle. You will see where the car went under the side. That is where it left the tell-tale evidence. [Conclusion of video presentation.]

So to wrap it up, what we need for underride protection, Mrs. Schroeder, is no more of the games of delay, no more of the politics interfering with NHTSA doing its job. No more of the reluctant truck industry that could or should on its own, without Federal regulation, the trucking companies could have voluntarily put on truck underride. That is the strange thing.

Sometimes there is a hearing about what should be done, but rarely is it pointed out that nothing stopped Fruehauf or other truck manufacturers from going ahead and putting safer truck underride devices under the trucks like they are now doing in Europe.

So we have to move ahead with truck underride guards. On the easel I am showing you what they do in Europe. I think it is embarrassing that if you go to Europe and you impact into a truck you can survive, but if the same family goes for a drive in America, they can go into the rear or the side of a truck and be killed.

I appreciate the opportunity, Mrs. Schroeder and committee members, to issue this testimony. I hope something constructive can be done for the warning labels for the seat belts that I described and that something constructive can be done to move ahead with the truck underride standard.

[Prepared statement of Byron Bloch follows:]

PREPARED STATEMENT OF BYRON BLOCH, CONSULTANT IN AUTO SAFETY DESIGN, POTOMAC, MD

I greatly appreciate this opportunity to present testimony to the Hearing on "AUTOMOTIVE SAFETY: ARE WE DOING ENOUGH TO PROTECT AMERICA'S FAMILIES?", conducted appropriately by the Select Committee on Children, Youth, and Families of the United States House of Representatives.

FROM MY OWN PERSPECTIVE AS AN INDEPENDENT CONSULTANT IN AUTO SAFETY DESIGN FOR MORE THAN 20 YEARS, I CONCUR WITH THE THEME AND URGENCY OF THESE HEARINGS as being of vital importance to America's families, and their safety on America's highways. As pointed out by the National Highway Traffic Safety Administration:
"Each year, motor vehicle crashes cost America $74 billion in economic losses. But beyond that, the true currency of crashes is tragedy. Every day, more than 125 American families assemble at grave sites around the country to mourn the loss of a family member -- frequently a young member killed in a crash."

OVER THE YEARS, I HAVE CONSULTED IN MANY ACCIDENT CASES IN WHICH A MAN, WOMAN, OR CHILD, OR MULTIPLE MEMBERS OF THE SAME FAMILY, WERE TRAGICALLY INJURED OR KILLED IN MOTOR VEHICLE ACCIDENTS. When I personally inspected the accident vehicles, and various exemplar vehicles as well, I frequently discovered safety defects and hazards that were needless. Safety hazards that could and should have been avoided. And there were safer, alternative designs that could and should have been implemented. Too many cars with unsafe fuel tanks, like the Ford Pinto and Chevy Vega. Unsafe seats, like in the VW Beetle and many other cars. Unsafe school buses, like in the Kentucky crash that burned 24 children and 3 adults to death. I try to evaluate the vehicle's "crashworthiness"...how well it did or did not protect the occupants from injury in the crash accident.

I HAVE MET WITH THE VICTIMS, THE QUADRIPLEGICS AND BRAIN-INJURED AND THOSE WITH MELTED FACES AND BURNED-OFF HANDS. I have met with the families in the quiet of a nursing home where their beloved children are locked forever in comas. I have gone to funerals, where the sorrow for the lost sons and daughters permeates into your soul. I know first-hand how and why many of these car crash victims were severely injured or killed. I am here to tell you that many of these past tragedies that happened...and countless future tragedies that will continue to happen...are so needless, so

very preventable. From my perspective in the trenches of auto safety, my life's work for over twenty years, I have direct knowledge of the two topics that I am here to discuss today: **seatbelts that are unsafe in particular ways, and truck underride accidents in which cars crash beneath large trucks and trailers.**

AMERICAN FAMILIES HAVE BEEN GIVEN SECOND-RATE SEATBELT SYSTEMS THAT HAVE DESIGNED-IN HAZARDS. The so-called "windowshade" type of seatbelt was utilized in tens of millions of cars produced by General Motors, Ford, and Chrysler from the mid-70's to their recent phase-out. This "windowshade" feature allows the shoulder belt of the driver and right-front passenger to extend out of the retractor...and stay out. This can inadvertently occur as you drive around, and can cause many inches of shoulder belt slack or looseness.

THEN, IF YOU'RE IN A CRASH ACCIDENT, THAT LOOSE SHOULDER BELT WILL FAIL TO SAFELY RESTRAIN YOUR UPPER TORSO...and you'll slam forward into the steering wheel, windshield, or pillar...and can receive severe or fatal head and chest injuries. Some people think that the loose shoulder belt will automatically tighten or snug up to your chest when the crash begins...but that's a misconception. The loose shoulder belt will stay loose during the crash, and will thus fail to adequately protect you from injury.

A SERIES OF DYNAMIC SLED TESTS CONDUCTED IN 1982 BY THE NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION (NHTSA) POINTED OUT THE LETHALITY OF HAVING TOO MUCH SLACK IN THE SHOULDER BELT. While the lap belt portion of the three-point continuous lap-and-shoulder belt was snug in all the tests, the amount of slack for the shoulder belt varied from 0 inches, to 1 inch, 2 inches, and finally about 16 inches (maximum possible slack). Instrumentation on the test dummies in these 30-mph simulated crash tests showed the potential for head injury went from no likelihood at 0 and 1 inch of slack, to possible injury at 2 inches, to very likely severe or fatal injury at 16 inches of slack. This series of tests was for the right-front passenger only...and the injury consequences for a driver with shoulder belt slack would likely be much more severe as his face, neck, head, and chest slam into the steering wheel.

THIS SO-CALLED "WINDOWSHADE" TYPE OF SEATBELT IS UTILIZED IN CARS, PICKUPS, AND VANS PRODUCED FROM THE MID-1970'S THROUGH 1990 BY GENERAL MOTORS, FORD, AND CHRYSLER. It is interesting to note the evolution of information, cautions, and warnings that have been put in the owner's manuals over the years. Here are some examples:

1976 FORD (Thunderbird):

CAUTION - An adjustment that results in more slack than is required to insert a fist between the shoulder belt and the chest may reduce the restraint system effectiveness.

1979 CHEVROLET (Camaro):
CAUTION: Use the least amount of belt slack to minimize belt pressure. Too much belt slack could reduce the amount of protection because the belt may not be able to properly restrain you in an accident.

1981 FORD (Thunderbird):
WARNING -- Never allow more slack than is required to insert a fist between the shoulder belt and the chest.

1982 FORD (Thunderbird)
To relieve belt pressure on your shoulder after the belt is fastened, a shoulder harness comfort regulator is provided in the retractor. This regulator allows you to adjust your shoulder belt length for optimum comfort. This comfort regulator works like a window shade.
WARNING - Never allow more slack than is required to insert a fist between the shoulder belt and the chest. .... Failure to follow these precautions could increase the chance and/or severity of injury in an accident.

1986 CADILLAC (DeVille)
CAUTION: To help reduce the risk of personal injury in collisions or sudden maneuvers, use the seat belts following the instructions in this section on their proper use...
For those who find the shoulder belt too snug, belt pressure against the chest can be reduced by using the tension reliever built into the shoulder belt retractor.
The least amount of belt possible should be pulled from the retractor (about 25 millimeters or one inch) to minimize belt pressure.
Keep any shoulder belt slack to a minimum. Too much belt slack could reduce the amount of protection in an accident because the belt is too loose to restrain you properly.

1986 FORD (Thunderbird)
WARNING - Never allow more than 1-1/2 inches (3.8 cm) of slack to be introduced into your seat belt system.
Failure to follow these precautions could increase the chance and/or severity of injury in an accident.

1988 DODGE (Caravan)
The amount of slack in the shoulder belt should be kept to a minimum. Too much slack may prevent the belt from properly restraining you in the event of an accident.

1991 OLDSMOBILE (Toronado)

Q: What's wrong with this? (Showing an illustration with a loose-fitting shoulder belt)

A: The shoulder belt is too loose. It won't give nearly as much protection this way.

CAUTION! You can be seriously hurt if your shoulder belt is too loose. In a crash, you would move forward too much, which could increase injury. The shoulder belt should fit against your body.

NOTE THAT AS THE YEARS WENT ALONG, THE INFORMATION FROM FORD, GM, AND CHRYSLER BECAME INCREASINGLY MORE CAUTIONARY. Obviously, they knew the dangers of shoulder belt slack (beyond one inch). **They knew the dangers,** yet they persisted with this slack-inducing windowshade feature year after year. Why? They had hoped that a shoulder belt looseness feature might encourage you to wear a seatbelt that you'd otherwise avoid if it felt too tight or chafed your neck. But rather than make better-fitting seatbelts with adjustable-height shoulder anchorages, or build them into the seat structure (which would require stronger seats), they came up with the foolhardy tension-relieving "windowshade" feature.

IMAGINE THE LUNACY OF MAKING A SAFETY BELT RESTRAINT SYSTEM THAT ITSELF GETS LOOSER AND LOOSER AS YOU DRIVE AROUND... WHICH DEFEATS THE VERY PURPOSE OF A RESTRAINT! And no, it doesn't automatically tighten to your body at the start of a crash (though such a pre-tensioning tightener could have been added at nominal cost). Ah, but if you and your passengers read the wording in the owner's manual, you'd know that you'd have to constantly be alert to the slack problem and regularly adjust the shoulder belt so the retractor would manually tighten it.

WHY DID NHTSA EVER ALLOW THIS SLACK-INDUCING SEATBELT? By the strategy of claiming a "comfort and convenience" benefit in their slack-inducing "windowshade" seatbelt, GM, Ford, and Chrysler hoped to thereby get the American public to wear their seatbelts in greater numbers beyond the 14-percent or so who regularly did (and also thereby prevail upon NHTSA to forget about requiring automatic restraints such as airbags). Thus, they urged NHTSA to permit such a system, and NHTSA reluctantly went along.

HOWEVER, NHTSA KNEW BETTER, AS REVEALED IN THEIR 1988 COMMENTS that "such devices may reduce the effectiveness of the belts in a crash situation if the tension-relieving devices are misused so as to introduce excessive slack in the belt webbing." GM, Ford, and Chrysler leap at every opportunity to bring up driver or passenger "misuse" whenever the issue of too much slack comes up! As if it's really your fault that excessive slack constantly occurs as you merely drive around in your car!

NHTSA SHOULD PREFERABLY HAVE NEVER ALLOWED "WINDOWSHADE" SEATBELTS. Or perhaps only on a conditional, temporary, trial basis but only if the design included an "off" switch that would disable any slack-inducing feature at the vehicle owner's option or permanently in any subsequent recall that NHTSA might require. Or only with an automatic pre-tensioner feature to snug the belt at the onset of a crash. But neither NHTSA nor the U.S. automakers ever seriously considered such safety features. It is also noteworthy that any slack-inducing features are outlawed in Europe, since the seatbelt's design must not cause improper fit during usage. GM and Ford both manufacture millions of cars in Europe for the European market...and none have ever had any slack-inducing windowshade devices.

NHTSA MADE A MAJOR ERROR: NO CRASH TESTS TO PROVE SEATBELTS REALLY WORK, SNUGLY AND ALSO WITH SLACK. NHTSA came into being in 1966, with a Congressional mandate to develop safety standards for our motor vehicles. Incredibly, from 1966 through 1989, **NHTSA never got around to mandating any crash test requirement to prove that seatbelts would work effectively in a collision accident.** No crash test to prove that seatbelts really work! Finally, when automatic restraints loomed closer, NHTSA at first demanded that any automatic seatbelts be crash-tested with whatever the maximum **permissible** slack was (as much as 16 inches). American automakers objected, and fought to base the crash test on the maximum slack **recommended** by the automakers themselves (only 1-1/2 inch). And when the crash test requirement finally came into effect by September 1989, GM and Ford declared they were phasing out their tension-relieving windowshade seatbelts.

IN 1979, UNDER ADMINISTRATOR JOAN CLAYBROOK'S ABLE LEADERSHIP, NHTSA BEGAN THE NEW CAR ASSESSMENT PROGRAM, NCAP, in which selected new cars are crashed into a barrier at 35 mph, which is 5 mph faster than any NHTSA safety standard to test steering columns and hood penetration. Over the years, many of the seatbelt systems, even though fastened **snugly** for the driver and front passenger dummies, nontheless **failed** to safely restrain the dummies from severe to fatal injuries. The wind-up retractors were allowing excessive spool-out of the belt webbing...causing a looseness that's analogous to having too much shoulder belt slack in a windowshade type seatbelt. Rather than continue to be embarrassed by NHTSA's NCAP crash tests, most auto manufacturers quickly corrected their seatbelt problems in future models.

WHAT CAN BE DONE TO HELP REDUCE THE SAFETY HAZARDS OF "WINDOWSHADE" SLACK-INDUCING SEATBELTS? Ideally, it would be wonderful if GM, Ford, and Chrysler would voluntarily recall the tens of millions of cars, pickups, and vans with windowshade seatbelts...and retrofit three-point manual

seatbelts that were both webbing sensitive and vehicle sensitive (like the dual-mode designs used in most European cars), without any slack-inducing windowshade feature. If it could be done at about a $100 per vehicle cost, times about 40 million or more vehicles, the cost would be at least $4-Billion...and is not likely to occur voluntarily or thru NHTSA pressure. The costs and the politics are much too mind-boggling.

A PROPOSAL THAT CAN HELP: PERMANENT WARNING LABELS. It is clear from their Owner's Manuals that GM, Ford, and Chrysler are willing to warn about the dangers of more than an inch of slack in the shoulder belt. However, to truly get the constant attention of the driver and right-front passenger, such warnings should be prominently displayed on both sunvisors at all times. I propose that two warning labels, preferably in black print on a bright-yellow background, with a permanent stick-on adhesive backing, be sent by GM, Ford, and Chrysler to all registered vehicle owners whose cars have windowshade seatbelts. Dealerships could also fasten the labels on any relevant vehicles that don't have such labels already affixed. And a national ad campaign could also alert the public. The labels could read something like this:

SAFETY WARNING! This vehicle is equipped with seatbelts that can cause too much slack or looseness in the shoulder belt, even during normal driving. You can be severely or fatally injured if the belt is too loose (more than one inch of slack). Please periodically check to make sure the shoulder belt fits you snugly, as it will not automatically tighten in a crash. The lap belt should also fit snugly.

ANOTHER HAZARDOUS SEATBELT SYSTEM: AUTOMATIC SHOULDER BELTS ONLY. In their rush to come up with a passive or automatic restraint system, many automakers decided to devise some type of automatic belt system. It would be cheaper than going with airbags plus a manual three-point seatbelt. However, the system that too many chose was an automatic shoulder belt only...usually with a knee bolster...with or even without a manual lap belt. And usually with a reminder in the owner's manual to advise you to always remember to buckle up the lap belt. Various surveys, including one by the University of North Carolina, showed that less than 30-percent of drivers and front-seat passengers remembered or even knew about the necessity of

also buckling the manual lap belt. **It is ludicrous and fraudulent to lull the public into believing these so-called "automatic" shoulder belts will automatically and safely protect you. They won't! Because you still must always remember to also manually buckle up the lap belt.**

MILLIONS OF U.S. AND JAPANESE CARS FROM THE MID-1980'S THROUGH THE PRESENT 1991-1992 MODELS UTILIZE SUCH AUTOMATIC SHOULDER BELTS. Some use a motorized shoulder belt that runs back and forth in a track above the door, while others are attached directly to the door frame. Depending on your body size and where the front seat is adjusted, there may be an unsafe gap between the shoulder belt and your chest...rather than a snug fit. Major automakers such as GM and Ford will shift to airbags plus 3-point manual seatbelts for the driver and right-front passenger...probably by the 1994-1995 model year...and these automatic shoulder belts will fade away as relics of the cheap, annoying, ineffective, unsafe designs that most are.

A PROPOSAL THAT CAN HELP: PERMANENT WARNING LABELS. As noted in the owner's manuals for most vehicles that have either motorized or door-mounted automatic shoulder belts, you are advised to always buckle your manual lap belt. In very recent and current 1992 models by some automakers, warning labels are a permanent part of the sunvisor...though typically on the unseen side (until you flip the visor down on a sunny day)! For example:

1992 FORD (Thunderbird) (Cougar)
IMPORTANT - Before driving, read the label on the other side of the visor.
IMPORTANT FOR YOUR SAFETY - Following these instructions will greatly improve your chances of avoiding severe injury in case of an accident:
- Always wear your lap belt when the car is moving.

1992 GM SATURN
CAUTION! Fasten Lap Belt. See back of visor for more details.
CAUTION! Not wearing your lap belt increases the chance of severe or fatal injury in an accident. The shoulder belt alone may not restrain you in all accidents. Always fasten your lap belt in addition to using the automatic shoulder belt.

WARNINGS LABELS SHOULD BE SENT TO ALL OWNERS OF AUTOMATIC SHOULDER BELT VEHICLES. To get the attention of both the driver and front-seat passenger, a warning label for each

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sunvisor should be sent to all vehicle owners whose cars have automatic shoulder belts. I propose that such warning labels have language similar to that for the General Motors Saturn (as noted above), preferably in black print on a bright-yellow background, with a permanent stick-on adhesive. Dealerships could also fasten the labels on any relevant vehicles that don't have such labels already affixed. And a national ad campaign could also alert the public.

"WINDOWSHADE" SEATBELTS AND AUTOMATIC SHOULDER BELTS SHOULD BE OUTLAWED AND PROHIBITED FROM ANY FURTHER USAGE IN NEW CARS. It is imperative to immediately outlaw and prohibit any futher usage of slack-inducing windowshade seatbelts in America. We were and are the only nation on earth where General Motors and Ford were able to politically pursuade our national auto safety agency, NHTSA, to accept such a dangerous design. In product liability court cases, where the injured victim claims the windowshade seatbelt failed to safely protect him, defendant GM or Ford argues that there's nothing wrong with that design because, well, even NHTSA permitted it. It is long overdue the time when NHTSA should prohibit, not condone, such a slack-inducing seatbelt from any further implementation in our vehicles. Similarly, so-called "automatic" shoulder belts should also be prohibited, since they are neither automatic nor safe, and always require you to remember to buckle the manual lap belt.

IT WAS AND IS WRONG FOR AUTOMAKERS AND NHTSA TO COMPROMISE ON THE SAFETY OF SEATBELTS. With the reliance by American families on the life-or-death potential of safety belts, it was and is wrong and reprehensible and unjust for too many automakers to have compromised needlessly on the design and performance of the seatbelt systems they have provided to us over these past twenty years. In particular, such compromising designs as the slack-inducing "windowshade" seatbelts, and the so-called automatic shoulder belts, have placed too many Americans in needless jeopardy in forseeable collision accidents. **Such unsafe seatbelts should be prohibited, and if the automakers and NHTSA both fail to act in a prompt manner to do so, then I urge this Congressional Committee to probe the reasons for such inaction particularly by NHTSA...and correct their failure by whatever Congressional legislation is appropriate.**

NHTSA HAS ALSO FAILED, PARTICULARLY BY POLITICAL INFLUENCE, TO CARRY OUT ITS MISSION AND ITS MANDATE TO VIGOROUSLY ENCOURAGE AND ASSURE THE IMPLEMENTATION OF THE SAFEST PRACTICABLE TECHNOLOGY IN OUR MOTOR VEHICLES. NHTSA should have ensured that the seatbelt systems in our cars, pickups, and vans were and are capable of preventing needless deaths and injuries to American family members. To do less than provide the best seatbelts, is a disgrace for those auto

manufacturers who have done so, and for the National Highway Traffic Safety Administration in allowing it to happen.

WITHIN NHTSA, THE TECHNICAL STAFF USUALLY KNOWS SAFER VERSUS LESS-SAFE TECHNOLOGY. The tragedy is when the politically-appointed NHTSA Administrator and the acquiescing lawyers are too willing to appease the automakers or the White House...and thereby compromise safety to the detriment of the American public. When then-Ford president Lee Iacocca told President Nixon in 1971 that "...the shoulder harnesses, the headrests are complete wastes of money" and "...you can see that safety has really killed all of our business...", a receptive President directed a massive delay of then-pending safety regulations. Then during the Reagan era from 1981 thru 1989, political control of NHTSA through administrators Raymond Peck and Diane Steed again crippled NHTSA's mission to maximize vehicle safety for the American public. In short, it is imperative to eliminate the political influences that have interfered with and constrained NHTSA from pursuing its mission toward safety.

TRUCK UNDERRIDE HAZARDS...ANOTHER EXAMPLE OF NEEDLESS TRAGEDY FOR AMERICAN FAMILIES. A truck underride accident is when a passenger automobile or van or pickup crashes into a large truck or trailer...and continues beneath, or underrides, that truck. Often, the car penetrates so deeply beneath the taller rear or side of the truck or trailer, that the passenger compartment is crushed and torn off. In some truck underride accidents, the occupants of the car may even be decapitated. This hazard has been known about since at least the 1950's. By various studies over the years, perhaps from 200 to 300 fatalities occur each year in truck underride accidents...plus thousands of injuries.

A HISTORY OF TRUCK UNDERRIDE KEY EVENTS SHOWS NEEDLESS DELAY IN ADOPTING UNDERRIDE-PREVENTION SAFETY GUARDS. In the 1950's, the first rear protection guard for large trucks and trailers was required. It was to be at the rear of the truck, at a height not to exceed 30 inches above the ground. It shall be substantially constructed and firmly attached...but there was no test requirement to evaluate its strength or effectiveness, This was known as the ICC guard, for the Interstate Commerce Commission.

WHEN NHTSA WAS FORMED IN 1967, ONE OF ITS INITIAL PROPOSED SAFETY STANDARDS WAS FOR A TRUCK UNDERRIDE GUARD. When the proposed standard was then published in the Federal Register in 1969, it required that the rear underride guard be "at a height of no more than 18 inches from the road surface." A subsequent revised version was published in 1970, with some minor changes to the test force and pentration depth

criteria. Car-into-truck crash tests from GM, Ford, and NHTSA added to truck underride knowledge.

THE NIXON ADMINISTRATION POSTPONES THE VEHICLE SAFETY REGULATIONS.
After a meeting with Ford president Lee Iacocca and chairman Henry Ford II, President Nixon gave the word to postpone many of the then-pending vehicle safety standards, including the one for truck underride protection. The rationale was cost effectiveness. Soon thereafter, the truck underride proposed rule was "terminated" because "the Administration has concluded that, at the present time, the safety benefits achievable in terms of lives and injuries saved would not be commensurate with the cost of implementing the proposed requirements." The cost for the safety guard was estimated at $125 to $175, versus a $200,000 value per human fatality. NHTSA concluded that it wasn't worth doing...to save from 35 to 300 lives per year.

A 1977 SENATE HEARING EXAMINES CAR-TRUCK CRASHES. The question of the delay in NHTSA's issuing a truck underride guard is prompted by a series of crash tests conducted by the Insurance Institute for Highway Safety, which dramatically shows the tragic consequences of cars crashing into and beneath trucks, versus the safety benefits of underride guards that prevent the tragedies. NHTSA is compelled to again issue a truck underride proposed standard, noting that the guard should be preferably 18 inches above ground level, for protecting smaller cars. NHTSA estimates that as many as 200 to 300 lives can be saved each year, plus about 8,600 personal injuries.

IN JANUARY 1981, NHTSA AGAIN FORMALLY PROPOSES A NEW SAFETY STANDARD FOR TRUCK REAR UNDERRIDE PROTECTION. Under the NHTSA administration of Joan Claybrook, NHTSA issues a $578,667 contract to conduct comprehensive truck underride tests, including many with large Chevrolets and subcompact Volkswagen Rabbits. The NHTSA project recommends that a 20-inch high guard appeared adequate to prevent excessive underride for the VW Rabbit at impact speeds from 30-40 mph.

THE REAGAN ADMINISTRATION TAKES OVER, WITH ITS DE-REGULATION ATTITUDE, and the new NHTSA administrator Raymond Peck and his successor Diane Steed keep the truck underride proposed standard on hold throughout the 1980's. In the meantime, the Swedish (in the mid-1970's) and the British (in 1983) and much of Europe adopt truck underride safety regulations, and install the safety guards on their large trucks and trailers. Meanwhile, in the U.S., virtually nothing is being done...either by NHTSA or by the truck and trailer manufacturers. The European standard adopts a 55 cm. guard height, which is almost 22 inches above the ground.

TODAY IN LATE-1991 THERE IS APPARENTLY SOME MOVEMENT REGARDING A TRUCK UNDERRIDE PROTECTION PROPOSED RULE. Though it's not yet published or publicly available for review, NHTSA seems to be on the brink of some possible new proposed rule for truck underride protection. But now, the probable recommended guard height will be 22 inches above the ground...close to the European 55 cm. height. This ignores NHTSA's original proposals at 18 inches, and the 1980 NHTSA recommendation for 20 inches (based on the VW Rabbit tests).

OVER THE PAST FEW YEARS, OUR CAR POPULATION HAS SHIFTED TO SMALLER CARS WITH MORE SLOPED-NOSE DESIGNS. Car bumpers are in the 16-to- inch height range And the height of most small and compact car tires is about 21 inches. For the best crash resistance, it's desirable to engage the front bumper and its support structures, plus the front tires, and the engine block as well. Yet NHTSA is apparently ignoring the safety benefits of the 18-inch guard height (which would thus help protect perhaps 40 percent or more of our car population).

THE EUROPEAN COMMUNITY HAS MOVED AHEAD WITH A SIDE UNDERRIDE GUARD, originally intended for keeping motorcyclists, bicyclists, and pedestrians from getting crushed beneath tall truck and trailer sides, but also helpful in deflecting away any cars as well. While NHTSA is aware that about half the underride fatalities are beneath the sides, versus the rear, of tall trucks and trailers, there is no consideration of any such safety guard for the U.S. Finally, the Europeans have also moved ahead with a truck conspicuity regulation, to make the rear and side of large trucks and trailers more visiable at night and in inclement weather and fog.

WHERE IS ANY TRUCK UNDERRIDE GUARD FOR THE U.S.? While the toll of deaths and injuries continue year after year, now estimated by NHTSA to be perhaps about 120 fatalities per year due to truck underride accidents, there is still no proposed rule....let alone a final standard in effect. The delay by a politically-controlled National Highway Traffic Safety Administration is totally irresponsible. After an on-again, off-again pattern of delay and more delay...from 1967 through 1991...there is no system of "cost-versus-benefit priorties" or other rationales to continue this 24 year delay.

SINCE IT TAKES ABOUT 10 YEARS TO CONVERT ALMOST THE WHOLE TRUCK AND TRAILER FLEET, after any final rule takes effect, America may not solve the truck underride hazard for perhaps another 12 years or so. What should the government vehicle safety agency and the trucking industry tell the families of the fatalities and crippled victims of needless truck underride accidents?

THANK YOU FOR THIS OPPORTUNITY TO TESTIFY IN PERSON. I hope I have shed some light toward resolving the question: "Automotive Safety: Are We Doing Enough to Protect America's Families?" I hope these issues can be resolved in a constructive, expeditious manner that will help protect America's families from needless deaths and injuries on our highways. Thank you.

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"WINDOWSHADE" SEATBELT HAZARD

Photo 1 - Tens of millions of cars, pickups, and vans were built by General Motors, Ford, and Chrysler from the mid-'70s thru about 1990... with a novel "windowshade" type of seatbelt feature.

The shoulder belt thus acts like a windowshade....you can pull it out of its retractor and it will stay out, and then you can pull it again and it will retract.

Photo 2 - GM and Ford promoted the "windowshade" feature as a way to alleviate too much shoulder belt tension and neck chafing for some.

They also argued it would encourage more people to buckle up (and it served as part of a ploy to stall a NHTSA mandate for airbags).

Photo 3 - The "windowshade" feature allows you to voluntarily cause slack or looseness in the shoulder belt (and can also loosen the lap belt in many designs).

But it can also induce excessive, dangerous slack...more than about one inch...inadvertently as you move slightly in your seat, or reach to adjust the radio.

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Photo 4 - Most seatbelts are a continuous lap-and-shoulder belt, with a retractor device that allows the belt webbing to be adjustable to different body sizes and seat adjustments fore-and-aft.

There's a small pendulum device that responds to deceleration of the vehicle (in hard braking or in a crash)...which then moves a lock bar to stop any further movement of the retractor reel.

Photo 5 - This amount of shoulder belt slack...anything over even one inch...can be dangerous in a crash accident.

It is preferable to keep the lap and shoulder belt snug to your body at all times...without any slack at all....but that's quite difficult to do and maintain with a "windowshade" slack-inducing belt system.

Photo 6 - A seatbelt is a safety restraint device. But if the shoulder belt has too much slack or looseness, it obviously fails to restrain you in a crash...and you can slam your head, face, neck and chest into the steering wheel, windshield, or pillar...and be severely or fatally injured.

These "windowshade" seatbelts do not automatically tighten to your body in a crash. (A self-tensioning feature is part of some recent European cars.)

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Photo 7 - Back in 1968, the new National Highway Safety Bureau (now NHTSA) mandated lap-and-shoulder seatbelts for the driver and right front passenger.

From 1968 thru September 1989, there never was any requirement to actually crash test a vehicle to verify the seatbelts would perform safely to protect the occupant in a crash.

However, in 1982, NHTSA finally conducted four "informal" moving sled tests...with only a right-front passenger dummy...to assess various amounts of slack in the shoulder belt ("windowshade" type).

With just 2 inches of shoulder belt slack, there was "probable injury".

Photo 8 - With the maximum amount of shoulder belt slack possible in the "windowshade" belt system (around 16 inches) there was a liklihood of a fatal head injury.

The idea of slack or looseness in a seatbelt is so anti-safety... so plain stupid...it's incredible that NHTSA ever allowed it in the first place!

Photo 9 - During the 1980's, the advisories in the GM, Ford, and Chrysler owner's manuals became more to the point.

A very recent example appears in bright yellow in the GM-Oldsmobile owner's manual:

CAUTION! You can be seriously hurt if your shoulder belt is too loose.

Yet, all these years, in tens of millions of GM, Ford, and Chrysler vehicles...there has not been any similar warning on the sunvisors or seatbelts to similarly warn you.

"AUTOMATIC" SEATBELT HAZARDS

Photo 1 - To comply with the NHTSA mandate to phase-in some type of "automatic" or passive restraint system (one that requires no action by the driver or passenger), many American and Japanese cars have adopted some type of "automatic" shoulder belt... but you must always remember to also buckle-up the lap belt!

One design has the shoulder belt buckled to the door frame and, as you close the door, the shoulder belt "automatically" comes across your chest.

Photo 2 - Another design has the shoulder belt attached to a "mechanical mouse" gadget that runs in a track in the roof, just above the door. When you close the door, the mouse moves rearward and thus the shoulder belt "automatically" comes across your chest.

These so-called "automatic" shoulder belts are invariably unbuckled (disconnected) at car dealerships and auto shows ...which is a violation of the Federal Law! (Car dealers are embarrassed to show customers such a stupid seatbelt system.)

Also, the shoulder belt fits so poorly, it reduces its restraint-ability in a crash.

And remember, you must always remember to buckle-up that non-automatic lap belt!

A recent University of North Carolina research survey noted that less than 30-percent had remembered to buckle their lap belt.

NHTSA has stated that automatic belts may be less effective than manual belts.

Photo 3

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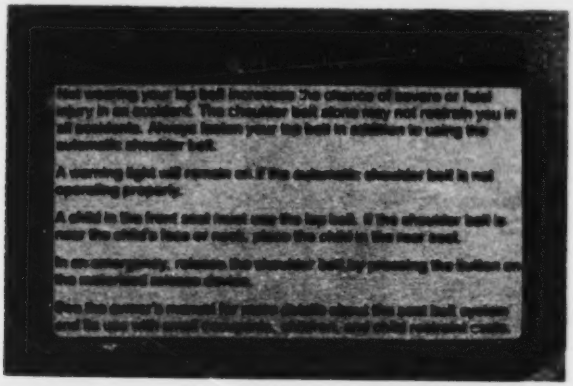
WARNING LABELS SHOULD BE SENT TO ALL OWNERS OF "AUTOMATIC" SHOULDER BELT VEHICLES. To get the attention of both the driver and the front-seat passenger, a warning label for each sunvisor should be sent to all vehicle owners whose cars have such "automatic" shoulder belts. Such warning labels could have language and appearance similar to that for the 1992 General Motors Saturn automobiles, as shown here:



TRUCK UNDERRIDE HAZARD

Photo 1 - At the rear of most large trucks and tractor-trailer rigs are very minimal "guards".

(Scenes from the film by the Insurance Institute for Highway Safety.)

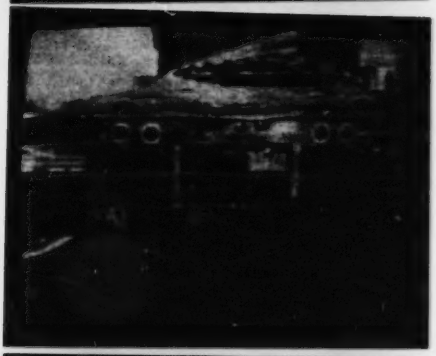


Photo 2 - These minimal "guards" are too high above the road level and are too weak to prevent a passenger automobile from crashing beneath the tall structure at the rear of the truck or trailer.

Photo 3 - The tragic results of a truck underride crash ...deep penetration into the car's "survival space", the top half of the car ripped off, decapitation of the driver and passengers. The estimates indicate possibly 200-300 fatalities and about 8,000 severe injuries each year in underride accidents.

Photo 4 - Crash tests by GM, Ford, and NHTSA in the late 1960s and 1970 showed how an improved underride guard can help. NHTSA proposed a rule in 1970...but it was canceled by a political directive.

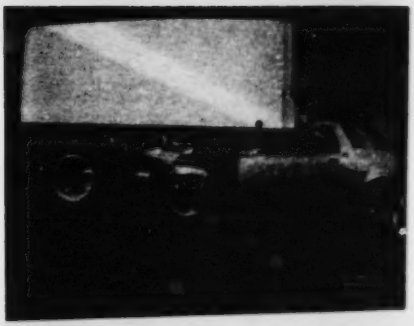


Photo 5 - The Insurance Institute for Highway Safety conducted a series of crash tests to show the hazards of existing minimal guards...as shown by this Ford Granada crashing beneath the tall rear of a large trailer.

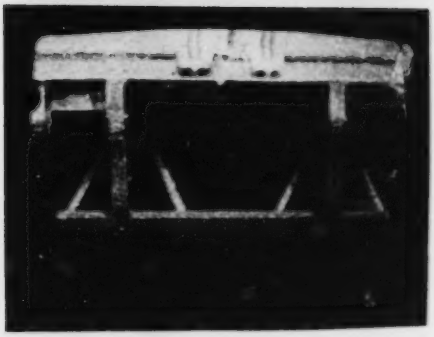


Photo 6 - Prototypes of safer underride prevention guards were designed and installed in the IIHS program...to show how simple and effective such improved guards could be.

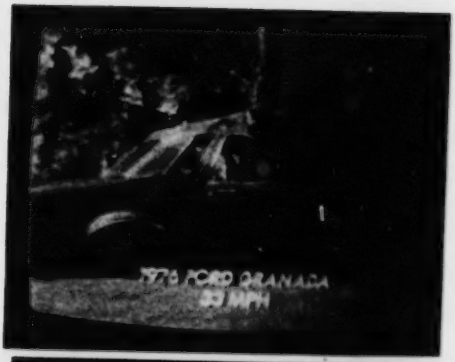


Photo 7 - In this IIHS crash test of a 1976 Ford Granada mid-size car impacting at 33 mph into the rear of a large truck, note that the ineffective so-called guard (30-inches above road, and too weak) fails to prevent the deep penetration...or "underride"...of the car beneath the truck.

Photo 8 - In this view from inside the car, the rear structure of the truck is seen crashing into the head of the right-front passenger.

Photo 9 - In contrast to the above photo 7, this similar crash of another Ford Granada into a truck equipped with a prototype guard (as shown in preceding photo 6) is quite effective in preventing any penetration into the passenger compartment "survival space".

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Figure 10 - In this IIHS crash test of a 1976 Chevrolet Chevette crashing at 29 mph into the rear of a large truck-trailer, the minimal present-day guard is too high and too weak to prevent this small car from penetrating deeply beneath the truck. The car's bumper structures, engine, and front wheels are all overridden.

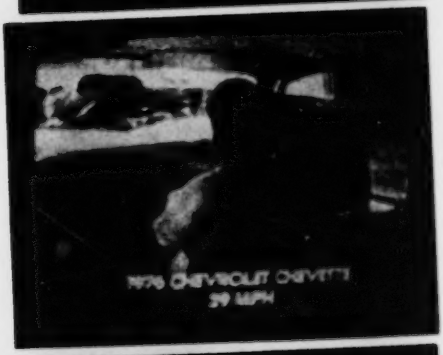

Figure 11 - In this view from inside the Chevette, the rear structure of the tall truck is seen penetrating into the passenger's "survival space" to cause an extremely severe or fatal head injury.

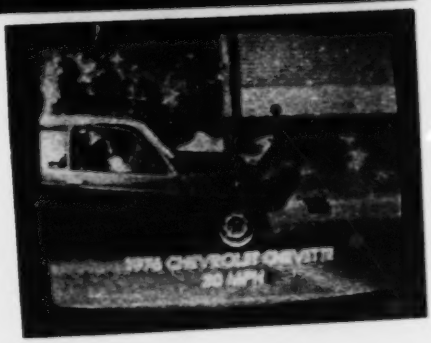

Figure 12 - In contrast to the above photo 10, a similar crash of another Chevette at 30 mph into the rear of a truck equipped with a prototype or proposed guard (such as shown in preceding photo 6) is quite effective in helping prevent the underride hazard, with the elimination of any penetration into the passenger compartment "survival space".

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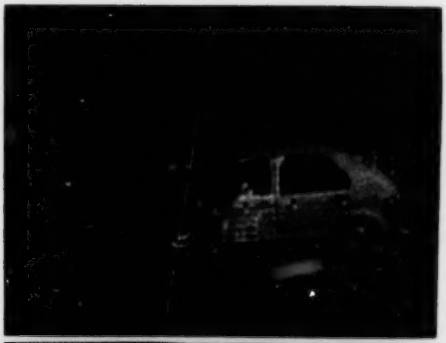

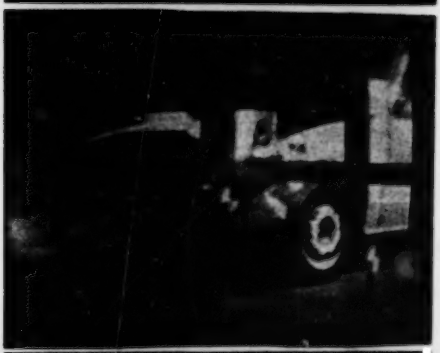

Photo 13 - After a 1977 Senate Hearing questioned the delay in NHTSA's issuing a truck underride prevention standard, the new NHTSA administration authorized a $578,667 contract to develop a compliance test for truck underride protection.

The 1978-1980 program included crash tests of various guard designs, heights above the road, and various car sizes.

The 1978 Volkswagen Rabbit is a typical front-wheel-drive small car...and is shown at left crashing into a guard that is 22 inches above the ground.

Photo 14 - Note how the 22-inch guard height is ineffective at the crash initiation...it goes above the bumper and its supportive structures (which are 16-to-20 inches above the ground).

The original 1969 NHTSA proposal was an 18-inch guard height.

Photo 15 - As the same crash progresses, note how the tires and suspension are also overridden. As the front of the car is pushed down to the road, the engine mass is overridden.

Thus, the 22-inch guard height is obviously ineffective in preventing the underride of small and mid-size cars (of contemporary slope-nose design).

This major NHTSA study thus recommended that the guard height not exceed 20 inches. (Final Report - Sept. 1980)

Paradoxically, the rumored pending NHTSA proposal in December 1991 is for a 22-inch guard height!

1969: NHTSA said 18 inches.
1980: NHTSA said 20 inches.
1991: NHTSA says 22 inches!?

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Photo 16 - This is typical of the so-called guards on most trucks and trailers since the mid-1950s to the present 1991. Originated by the Interstate Commerce Commission (ICC), the requirements are minimal and grossly ineffective.... including a 30-inch height above the ground, no specific requirements for strength, and no crash-testing to show how effective they need be.

Photo 17 - This is an example of a prototype guard devised by the IIHS, and demonstrated in their mid-1970s crash test program to show the safety merits of improved guards that were significantly more safety effective than the common ICC guard.

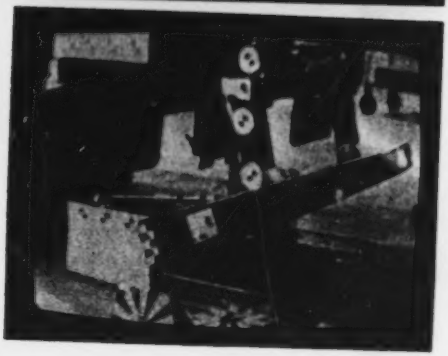

Photo 18 - While NHTSA has proposed rulemaking for truck underride guards in 1971 (politically cancelled by the Nixon administration) and then again in 1981 (again politically cancelled by the Reagan administration), the European nations have adopted and implemented underride guard regulations since 1983, beginning in Sweden and the United Kingdom. Shown here is an underride guard in England.

Photo 19 - In many truck underride accidents, perhaps as many as half of the fatal incidents involve the car crashing beneath the side of the truck or trailer.

In this accident, the truck was negligently making a left turn in front of oncoming traffic.

Photo 20 - This Honda Accord sedan was unable to avoid the large tractor-trailer that was turning in front of his path, and the Honda crashed into and beneath the tall right-hand side of the trailer...ripping off the entire roof structure of the car and killing the driver.

Photo 21 - There was no side underride prevention guard on the accident truck....nor is there any pending proposal by NHTSA to develop or mandate such underride prevention guards for the sides of trucks and trailers.

Europe presently has side underride guards for cyclists and pedestrians...and is now considering strengthening them to enhance their ability to prevent car underride as well.

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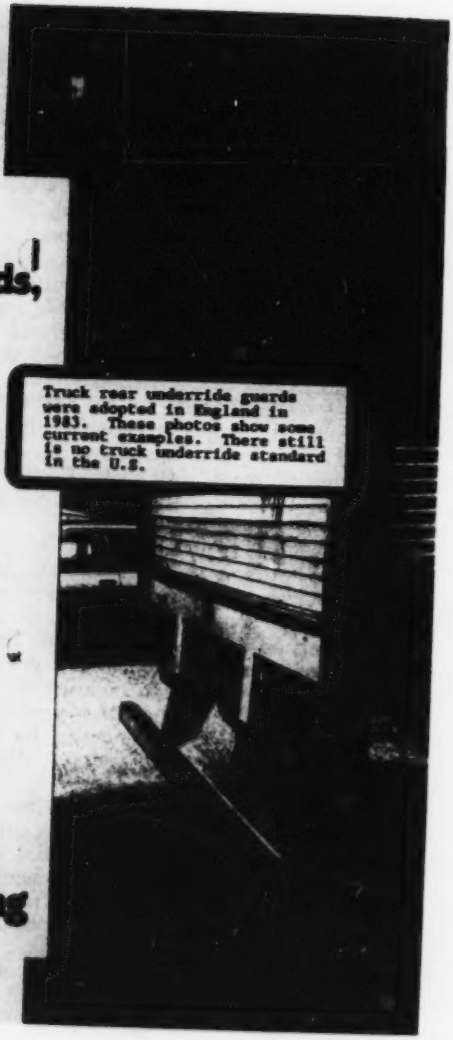
In a few yards,
and fewer seconds,
the impact on
your truck...

your business...

a light vehicle...

and its occupants
could be shattering



Truck rear underride guards were adopted in England in 1983. These photos show some current examples. There still is no truck underride standard in the U.S.

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Chairwoman SCHROEDER. Thank you very much. It sounds like reflective bandaids won't solve the whole thing.

Congressman Johnson, do you have any questions?

Mr. JOHNSON. No, thank you.

Chairwoman SCHROEDER. Congressman Martinez.

Mr. MARTINEZ. Yes.

While you were talking, I was conjuring up pictures in my mind. You talked about the windowshade seat belt and the automatic seat belt. These things come into my mind. It goes back to a thing I saw a long time ago when seat belts were first being put in cars.

I was in Texas at a Rotary convention. I was at the golf course. The gentleman asked me if I wanted to have a ride. I said sure. I had a friend with me. The man with the car said, "On one condition, when you get in my car, you don't touch anything in my car."

We didn't know what he meant. We thought he meant the radio. My friend Dan touched the seat belt and it was welded shut. The guy said, "See I told you. If you need to have seatbelts, you don't want to ride in my car." We asked him why he did it. He said, "I don't want government in my car telling me what to do." That is a sample of the thinking that goes on out there.

You will notice after seatbelts started being put in cars, the states started passing laws to make people put on the seatbelts. I will bet today there are a lot of people who don't fasten their seatbelts when they get in.

So you say there was a warning sign put in by General Motors that tells the person who put on the seatbelt. How do you force people to live up to the responsibility for their own safety? Warning signs are not going to do it.

I am concerned about the children. They have no control over it. I have seen parents do things like carry pets and kids not anchored down in the back of an open pick-up.

What do we do? Besides the warning signs, the individual has some responsibilities. The car manufacturers can put them in but if they have to be fastened mechanically, how do you force them to do it?

As far as the mechanisms themselves, you know the race drivers have always led the way in safety features. Do they have automatic set-ups or do they have to hook their own? If they have a better device in their cars, why has it not been applied commercially and how do we make people responsible for their own safety beyond the law that does not make them do it and the warning signs that do not make them do it?

Mr. BLOCH. Your points are very well taken, Mr. Martinez. The points I made this morning are not to automatically correct the problem with the seatbelt but because the industry erred, because they went ahead with a stupid seatbelt design in the first place.

What can we do years later to try to alert the public about them? Yes, it would be best to force a recall of those belts and put in safer belts so you would not even need those belts in the car. But here we are years later and I am saying what can we do to alert people to the dangers in windowshade belts and the automatic set belts.

Mr. MARTINEZ. My question goes beyond that point. But how do we get people to understand the danger to their own safety and use those devices that we put in?

Mr. BLOCH. Well, I think we have to reshape a bit of the thinking, the enlightenment on their own mortality and the car is fun and joy only. In other words, the crash tests the car companies do, General Motors, Ford and Chrysler, they stamp them confidential.

If you buy one of their cars and say, will you send me the crash tests so I can appreciate better what will happen, they don't provide you that information. It is not in the showrooms. So you don't know. If you don't know the consequences of not putting on your seat belt, for example, or by not wearing it properly, snugly to your body, you may be foolish enough to think, I am immortal, it won't happen to me.

The answer is continuous education starting at the elementary school level into the high schools and television. Don't forget that motor vehicle accidents are a serious matter and it is not just how quick is my car and how fancy is the styling, et cetera.

It is a life or death matter and parents have a responsibility to educate their children in that regard. They do not allow automatic belts in race cars. They are not allowed in Europe. Ford and General Motors make cars that they sell in Europe that have superior seatbelts to what they give American consumers here. I think that is an important point.

The current chairman of General Motors, I know him personally, he is an engineer and a terrific human being. He was the head of Opel for a while. He knows they have better belts in Europe. He came back here to General Motors. He is not here to testify. You could ask the chairman of Ford Motor Company, also not here today, ask them, why do you give European cars superior seat belts with no slack feature, no automatic shoulder belts? Why do you give the European cars that you make safer seatbelts and shortchange the American consumers with the worst seatbelts on the Planet Earth, the worst in America.

They tell you to buckle up for safety and your life depends on it and they give you garbage seatbelts. They are not even here. Maybe at your continued hearing two weeks or so from now, maybe General Motors or Ford will appear to respond to those questions. These hearings will continue and I think the leadership, the chairman should be here.

Mr. MARTINEZ. Is the reason they get better seatbelts because of their law or market demand?

Mr. BLOCH. Two reasons predominantly, one, is they are more sensible in that there is a dynamic sled test that represents a crash test. Do you know, Mr. Martinez and Mrs. Schroeder, in the United States of America those seatbelts required in our cars starting in 1967 with the first Federal safety standards from NHTSA, to this very day, that for all those years there was no crash test requirement to prove that those lap and shoulder belts in your car would really work in a crash?

Gee, golly, they overlooked it. In Europe they did not overlook it. They not only have a dynamic test to demonstrate that they work, but you cannot have a seatbelt that is so loose that it will not properly fit your body to protect you in a crash, ergo, you cannot have a slack belt because it will not fit you properly.

The Europeans are way ahead in their safety standards. As Joan Claybrook pointed out, and you pointed out Mrs. Schroeder, our

standards came out in the late 1960s, early 1970s and we are still in the basement. Those should not be called Federal safety standards. That is a fraud. They should be called minimal level requirements, not Federal motor vehicle safety standards.

If you called them what they are, minimum level requirements, then the corporations will be forced to go above those minimal level requirements and in court cases where injured plaintiffs sue the car companies for unsafe design, the car companies come in and say "Don't blame us, our car meets the Federal safety standards so it must be safe". That makes a mockery out of the words "Federal safety standards" and the intent of them.

Mr. MARTINEZ. Thank you.

Chairwoman SCHROEDER. Thank you very much. We appreciate your being here today and we appreciate your bringing your family.

Mr. BLOCH. Thank you, Mrs. Schroeder.

Chairwoman SCHROEDER. Our next witness was supposed to be from the American Trucking Administration. We understand they did not come. Is that correct? I don't see anyone out there. I guess we had a witness who called in last night and said they would not come and they did not come. We are very sorry about that.

Our next panel is Ben Kelley, President of the Institute for Injury Reduction in Upper Marlboro, Maryland and Brian O'Neill, President of the Insurance Institute for Highway Safety in Arlington, Virginia. If you will stand we will swear you in at this point.

[Witnesses sworn.]

We welcome you back, Mr. Kelley and Mr. O'Neill. If it is possible, would you summarize your statements and we will put the full one in the record. Mr. Kelley.

STATEMENT OF BEN KELLEY, PRESIDENT, INSTITUTE FOR INJURY REDUCTION, UPPER MARLBORO, MD

Mr. KELLEY. Thank you for asking IIR to testify.

It is a shame that the NHTSA is not here today to hear this much-needed information.

The Institute for Injury Reduction is a nonprofit public service organization founded by attorneys representing people injured by product hazards, attorneys who are committed to reducing the needless bloodshed they see so frequently.

Our membership is open to anyone who shares that goal.

My written statement is a lengthy discussion of the issues before your hearing—truck underride, unsafe "passive" belts, and the hazards of slack caused by so-called tension reliever windowshade devices. My statement today is largely devoted to the windowshade issue which exemplifies all that has gone wrong at the NHTSA since 1981.

I have included in the materials I have submitted to the staff a copy of the underride video portions Mr. Bloch showed and which Mr. O'Neill and I produced and conducted in the 1970s. I am delighted that you had that as part of your record.

The National Highway Traffic Safety Administration Act of 1966 is unconditional in its mandate that NHTSA must set adequate vehicle safety performance standards and recall unsafe vehicles.

NHTSA's leadership since 1981, however, has seen fit essentially to scrap that mandate and, instead, to leave motor vehicle safety regulation up to the companies that make the vehicles. IIR has done extensive work in the windowshade and passive belt injury areas, and you have asked me to address these.

To sum up, the windowshade device has one purpose and one only and that is to cover up for the unwillingness of domestic car companies to make lap-shoulder seat belts that fit the wearers safely and properly.

For well over a decade the U.S. car makers designed the belts to fit the cars, not the people. That meant that web routings and other essentials were minimized or ignored. The result was that uncomfortable and unsafe belts were being used. To offset these harmful characteristics, the companies added windowshades; thus they offset the discomfort of the ill-fitted belt by introducing another hazard, slack, in order to keep the belt off the face and neck. The belts became even more dangerous and less useful.

Certainly belt slack caused by the windowshade has been a factor in countless deaths and injuries. The windowshade is like a dagger made of ice that melts after the murder. This is because in post-crash attempts to rescue the victim, the slack caused by the windowshade is cancelled and disappears when the door is opened. This destroys the evidence of the windowshade's role.

In 1980 NHTSA was moving to ban or restrict windowshades and force the companies to design safe belts. But that changed in 1981. NHTSA began then to collaborate with the companies to protect hazardous windowshades.

NHTSA does this yet today. It has refused all requests by safety advocates to have this dangerous system prohibited. All this is covered in detail in my written statement. I want to urge the committee, if it does nothing else as a result of this hearing to take one important step: demand that the car companies and NHTSA undertake an aggressive program to permit and encourage the disconnection of windowshade devices on request of car owners who don't want those hazards in their cars any longer.

Warning of the hazard is desirable but it does not eliminate the windowshade slack danger. An adequate corrective approach would involve not only warning owners of windowshade cars, and there are probably more than 100 million of those cars on the road today, that the slack device is hazardous, but it also would disconnect it for those who don't want to place their loved ones at risk.

[Demonstrating.]

I am holding a belt retractor equipped with a windowshade device. Note that the windowshade device can be removed by one snip of metal cutters leaving the rest of the belt in perfect operating condition. There is absolutely no reason why this cannot be done for less than 50 cents in less than five minutes. Disconnection can be done in a moment at any dealership at little if any cost and has no effect on the belt's performance.

But the companies refuse flatly to promote or provide this safety-enhancing step. They refuse to take out the slack. They even refuse to effectively warn motorists about this danger. We ask NHTSA to begin to implement the 1966 Motor Safety Act by banning unsafe windowshade belts and recalling belts that needlessly permit injury

or death. That also includes many of the passive belt designs and lap-only belts.

The public depends on NHTSA to protect its safety in car crashes; promoting disconnection of slack-inducing windowshade devices would be an excellent starting point.

Madam Chair, you mentioned the absence of an NHTSA witness here this morning. If NHTSA were headed by a person as committed to the public's health as former Surgeon General Koop was committed to the good of the public health, he would be here to testify about money needed, staff needed and commitment offered to save lives in highway crashes.

NHTSA is the single most important health agency in the United States, based on the numbers of deaths and injuries to people in this country. It is an outrage that we do not have a Surgeon General Koop at the head of that agency. Thank you for asking us to be here.

[Prepared statement of Benjamin Kelley follows:]

PREPARED STATEMENT OF BENJAMIN KELLEY, PRESIDENT, INSTITUTE FOR INJURY REDUCTION, UPPER MARLBORO, MD

Chairwoman Schroeder, members of the Committee, we are pleased to respond to your invitation to appear at this hearing.

The Institute for Injury Reduction is a non-profit public service organization founded by attorneys representing people injured by unsafe products. We undertake research and public education programs to reduce the prevalence of such products and the injuries they cause. Our membership is open to all individuals and groups who share this goal.

Today you are holding hearings into the steadfast refusal of the National Highway Traffic Safety Administration to take action against three notorious motor vehicle design features that needlessly cause, allow or aggravate injuries to children, adults and

families in car crashes. They are (1) slack-inducing "windowshade" seat belt designs, (2) "passive" belts, and (3) lack of truck underride protection.

Each is an example of the continuing failure of the leadership of the National Highway Traffic Safety Administration to protect the nation's motorists from needless, catastrophic injury on the highways. By itself, each is so egregious as to warrant a separate Congressional investigation. Together, they define the pattern of NHTSA's systematic, decade-long malfeasance of its statutory duty to set motor vehicle safety standards that protect children, adults and families from ravaging harm in entirely foreseeable car crashes, and to recall vehicles that inflict such harm.

The National Traffic and Motor Vehicle Safety Act of 1966 is unconditional in its mandate that NHTSA must set adequate vehicle safety performance standards and recall unsafe vehicles.[1] NHTSA's leadership since 1981, however, has seen fit essentially to scrap that mandate and, instead, to leave motor vehicle safety regulation up to the companies that make the vehicles. (For example, those companies were bitterly opposed to providing air bags in new cars, so NHTSA in 1981 undertook to kill the "passive restraint" standard. It took a Supreme Court decision to breathe life back into that vitally important regulation.[2])

The laissez-faire attitude of NHTSA's current leadership was stated as follows in a 1988 rulemaking document: "As a policy matter, the agency has generally concluded that there is no

compelling safety need for it to act when vehicle manufacturers are voluntarily taking the desired steps absent any Federal requirement to do so.[3]" (Nor, it should be added, when they are not taking such steps.) Does such a policy square with the Act's purposes?

We think not. The Act's framers saw that "the unconditional imposition of mandatory standards at the earliest practicable date is the only course commensurate with [reducing] the highway death and injury toll," and that "the promotion of motor vehicle safety through voluntary standards has largely failed.[4]" NHTSA's "volunteerism" policy thus would turn the Act and its goals into confetti - and in too many instances, including those being examined in today's hearings, that is what already has happened.

IIR has done extensive work in the "windowshade" and "passive belt" injury areas, and you have asked me to address these. In addition, I have been deeply involved for many years in the matter of injuries caused by lack of adequate truck underride protection. Materials bearing on that issue, which may be helpful to your investigation, have been provided to your staff for inclusion in the hearing record. In addition we have provided the staff with a documentary film, "Underride," which I produced in 1973 at the Insurance Institute for Highway Safety, bringing to the attention of NHTSA and Congress the seriousness of these injuries and the availability of design countermeasures to them.

Turning now to NHTSA's failure to use its rulemaking or recall powers to remove unsafe seat belt designs from the marketplace:

Seat belt designs are like vaccines. Some vaccines are less effective than others in eliminating target diseases. Some have detrimental side effects ranging from discomfort to the actual causation or aggravation of other diseases. So it is with belt designs; some are less effective than others, and some are downright dangerous in that they can cause or aggravate injury.

What is NHTSA's leadership doing about such designs? Nothing at all. It is failing to warn the motoring public about inadequate or hazardous belts. It is failing to take recall action against such belts. And, with one exception, it is failing to set standards to preclude such belts in the future.

The exception is belts in rear outboard seating positions. In 1989, belatedly and only after the industry had agreed, NHTSA published a requirement that those positions be provided with lap-shoulder belt combinations, thus at long last eliminating the deadly hazards of lap-only rear outboard belts in new cars.[5] Those hazards had been known for decades by the car companies and NHTSA[6], but it took lawsuits by injured people[7], a critical report by the National Transportation Safety Board[8], and vocal outrage by some safety groups to force this change. Even today, NHTSA's administrator refuses to warn the public about rear lap-belt injury hazards in existing cars or effectively to promote retrofitting of those cars with lap-shoulder belt systems.

As a rule, inaction carries the day when unsafe belts are brought to NHTSA's attention. The agency's failure to either recall unsafe passive belt designs - also the subject of this hearing - or to set standards precluding them in the future exemplifies this. Attachment No. 1 to this testimony contains IIR materials addressing the injury-producing hazards of the two most common passive belt designs, which was the subject of a major IIR public education effort earlier this year.

In the first design, the belt is attached to the door, thus allowing belted occupants to be ejected when the door opens. In the second, the passive shoulder belt is separate from the active lap belt - or, in some models, there is no lap belt at all. The dire injury-producing hazards of shoulder belts without lap belts has been documented for decades[9]; Sweden, a nation with an exemplary record in motor vehicle safety regulation, forbids such belts.[10] In fact, NHTSA once required, in FMVSS 209, that motorists be warned never to use shoulder belts without lap belts because of their injurious potential.[11] But it has waived that warning for passive shoulder belts.

The solution, of course, is for NHTSA to outlaw dangerous passive belt designs and, in addition, to require air bag-seat belt systems for front seat passengers. NHTSA's administrator has declined to take either step despite his agency's own data showing the superiority of the air bag-seat belt system. (See Attachment 3 to this testimony.) Last week, in a stunning commentary on NHTSA's indifference to vehicle safety progress,

Congress passed a law setting just such a requirement to take effect in the late 1990s.[12] Congress did the job that NHTSA's administrator should have, but did not, carry out.

The remaining subject of this hearing is the window shade slack belt hazard.

Belt slack has been recognized for decades as a peril to be strictly avoided by car designers and car occupants.[13] In a crash, slack can severely impair or entirely negate the belt's effectiveness by allowing the wearer's body to smash forward into hostile, injurious structures in the car's interior. In some cases, slack can allow the occupant to come out of the belt entirely, leading to injuries in the vehicle or to ejection.

Despite this, the device called the "window shade," which actually produces and encourages hazardous seat-belt slack, was introduced into new car designs by domestic manufacturers in the mid 1970s. Since then those manufacturers have equipped tens of millions of cars with the windowshade device as a standard feature. And for the past decade, NHTSA has stood by, letting them get away with it.

(Attachment No. 2 to this testimony is a detailed chronological summary of key NHTSA, manufacturer and related documents bearing on the window shade's history. As appropriate the following discussion cites relevant items in that summary.)

The window shade, first developed by General Motors, is also known as the "tension reliever" and "comfort feature" - soothing names which mask its deadly performance. The window shade permits

the shoulder portion of the belt to be made loose, either when the user pulls it into a slack position or when unintended slack creeps into the belt as the user moves about while operating the car, reaching for the radio or glove compartment, or otherwise moving about in the seat. It is impossible for the user to know just what movements will put unintended slack into the belt under what conditions, and therefore she or he cannot know what movements to avoid.

Once slack is present in the windowshade belt, it will remain there unless the user becomes aware of it and makes a positive tugging action on the belt to cancel the slack. Sometimes the tugging action will fail to remove the slack, or will remove it only partially. If the slack is pooled behind the user, under the fold of a coat, or in some other unnoticed location, the user will not notice it and will have no opportunity to remove it. Further, the slack may creep into the lap portion as well.

If window shade slack is present in the belt when the car crashes, it will not be canceled or retracted when the belt locks up. Unknown to most users, the belt will remain loose when the occupant's upper torso, propelled by the crash, hurtles forward. The belt will provide no protection until the body impacts the loose webbing. At that point, depending on the occupant's momentum and direction, it will provide diminished or no protection. In fact, in some crashes the loose webbing, when it is abruptly impacted by the occupant's body, may itself become a

cause of injury. It may seem beyond belief that car companies ·uld force such a hazard on their customers and that NHTSA would allow them to do so. Yet this should not be surprising. These are the same companies which, after developing air bag passive-restraint technology in the early 1970s, kept it off the market for nearly twenty years - and the same NHTSA that tried in 1982 to permanently kill the federal passive-restraint requirement. In that context, their actions to imperil motorists' lives with window shade belt slack devices, while repugnant, are consistent with their demonstrated antipathy to meaningful safety progress.

The history of the window shade is a history of manufacturer and regulatory indifference to the safety of motorists - of putting manufacturer convenience and profit before injury prevention.

The window shade came into being because in the early 1970s GM and other domestic manufacturers did not care enough about safety to design their cars and seat belt systems so that the belts provided a comfortable fit for a wide range of user sizes ·nd shapes, i.e., without pressing too tightly against their bodies and without crossing and rubbing against their necks and faces. Meanwhile, a growing number of foreign manufacturers were developing well-fitting belts reflecting sensitive, user-friendly engineering and anchorage placement dictated by safety concerns, not cosmetic or stylist concerns.

It was generally recognized in safety circles that the better the belt fit, the more likely the belt would be used.

Substantially higher U.S. belt use levels for foreign-built cars than for domestic-built cars appeared to bear this out. But the domestic companies seemed not to care; instead of designing belts with user-friendly fitting characteristics they simply decided, beginning in the mid-1970s, to add window shades to their uncomfortable systems. The wearer who was bothered by a belt cutting across a face or neck, or a belt pressing too tightly against the body, could "fix" the problem by putting slack into the belt - and in the process, putting herself or himself at increased risk of injury in a crash.

Without doubt the system was responsible from its earliest introduction for deaths and injuries that would have been prevented by snug, well-fitting belt designs. However, these apparently went largely undetected. For one thing, belt use levels in the U.S. during the 1970s and early 1980s were quite low - never higher than 20 percent in observed use surveys. That meant that a relatively small population of motorists was exposed to the window shade slack hazard during its early years.

Moreover - and of special importance - the window shade, while producing deadly slack, usually leaves no evidence in the wake of its harm. Window shade belts are designed to cancel their slack and retract when the car door is opened or the belt is unbuckled. This means that after a crash has occurred and rescue operations are in progress, the very act of extricating

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dead and injured occupants is likely to cause the incriminating belt slack to disappear. Thus the window shade, like an ice dagger that melts after the murder, is an untraceable agent of injury.

As increasing numbers of domestically made cars were equipped with window shades during the late 1970s and early 1980s, the device's hazards became apparent, as did the injuries it was producing. Court suits against manufacturers were filed as a result of such injuries.[14] The National Transportation Safety Board began to urge NHTSA to prohibit or discourage the window shade, and - at least initially - NHTSA itself seemed responsive. (Attachment No. 2, Nos. 19, 24) In fact, during the late 1970s it appeared that the regulatory agency was prepared to stop the car companies from equipping their cars with window shades. Rulemaking proposals and contractor research reports published by NHTSA condemned the device and developed stringent test requirements to inhibit its slack-producing capabilities. (Attachment No. 2, Nos. 1, 2, 3, 5, 6, 7, 10)

But during the 1980s NHTSA, under changed leadership, reversed course. In response to manufacturer requests starting in 1981, it delayed, then dropped, its slack-inhibiting test requirements. In its restraint-system rulemaking notices the agency began to characterize window shade slack hazards as "misuse" by belt wearers rather than misdesign by manufacturers, thus echoing one of GM's window shade defenses. It repeatedly denied petitions by safety advocates seeking recall of defective

window shade belt systems and adoption of regulations to discourage future such systems. And, it ignored NTSB recommendations that window shades be discouraged or prohibited, particularly because they could produce belt slack inadvertently, without the user's knowledge or wish. (Attachment No. 2, Nos. 11, 12, 14, 15, 17, 18, 20, 23)

NHTSA's justification for continuing to allow the window shade device became, during this period, that the device was needed because it increased belt use levels. Even if slack might produce injury - or so NHTSA claimed - the overall effect of the window shade's presence was to encourage larger numbers of people to use their belts. This also echoed a developing GM argument in defense of the window shade - one, however, which was entirely unsupported by research or other data. (In fact, during the 1970s GM had fought NHTSA proposals to require more comfortable and better-fitting belts by repeatedly contending that making belts more useable was not a proven way to encourage more people to use them. Its new position, that window shades promoted use by making belts more comfortable, directly contradicted its old one.) (Attachment No. 2, Nos. 4, 8, 9, 11, 18)

The "increased use" position was, of course, unfounded and untenable. As Australia, Sweden and the U.K. demonstrated years earlier, the only way to achieve durable and substantial belt use increases was through legislation - something that America had resisted and American car companies had declined to lobby for.

With or without windowshades, belts were not being used in important numbers in this country until the mid 1980s, when States increasingly began to enact belt use laws.

(At this point the companies did lobby vigorously for those laws. Their purpose, which they failed to achieve, was to head off the passive restraint requirement promulgated in 1984 by NHTSA and the Department of Transportation under the Supreme Court decision reversing the Reagan Administration's attempt to kill the requirement.)

The "increased use" argument remained unsupported until 1989. Then, with GM funding, three researchers published a study claiming to show that window shade cars had higher belt use levels and lower injury levels than earlier non window shade cars.[15] The study, however, was fatally flawed in two obvious respects, as described by subsequent analyses of the study.[16]

First, in comparing GM non window shade and window shade cars, it ignored the fact that the former were equipped with so-called Automatic Locking Retractor (ALR) belt systems, while the latter were equipped with Emergency Locking Retractor (ELR) systems.

The difference - which had nothing to do with the windowshade device - was critical; ALR belts, which were hard to buckle and became uncomfortably tight when worn, have a well-documented history of discouraging people from using their belts. ELR systems, which GM introduced simultaneously with the window shade device, were easy to don and more comfortable to wear.

Second, the GM-funded study had failed to account for age differences between the older non-windowshade cars and the newer window shade cars - differences which could strongly affect their belt use and crash injury histories. It was clear that the GM-funded study was grossly incompetent and that its results might have been completely reversed had it accounted for these important and obvious factors.

The net outcome of this misbehavior by NHTSA, GM and other manufacturers using window shade devices is that tens of millions of cars remain on the highways today with such hazardous systems. By and large manufacturers have discontinued window shades as they have introduced passive belts, but there is no regulation to prevent their reintroduction.

Nor, tragically, has there been any move by NHTSA to have these hazardous systems recalled and corrected. As stated, the agency has rejected petitions for window shade recalls. They and the manufacturers are entirely willing to leave these deadly devices on the highways, meaning that as more and more people wear their belts in response to state use laws, more and more people will be exposed to the risks of increased crash injury due to slack in their belts. (Attachment No. 2, Nos. 21, 26, 30-33)

In fact, NHTSA and the manufacturers are even unwilling to disconnect and deactivate the window shade device for car owners who do not want it in their car and would pay for its removal. Window shade deactivation is a simple procedure which does not affect the belt's operation in any way, other than to improve it

by removing the risk of slack. In 1989 IIR asked the companies and the federal agencies to inform motorists of the hazards of the windowshade and to arrange for dealers to deactivate the device on request. This entirely reasonable idea was rejected or ignored by the companies and NHTSA. To this day, dealers refuse to deactivate the windowshade for safety-conscious car owners who know that slack is bad and do not want it creeping into their belt systems. (Attachment No. 2, Nos. 28, 29)

What can be to reduce the window shade hazard that NHTSA and the domestic car companies have spawned in tens of millions of cars? First, NHTSA should immediately inform the public of the dangerous nature of this system, through a vigorous public information program that identifies cars equipped with window shades. Second, it should cajole, urge and otherwise use its influence to induce the companies to deactivate window shades for all car owners requesting that safety precaution - at no charge if possible. Third, it should undertake recall actions against all such devices - a process that may take months or years, but is urgently needed to clear the environment of these ticking time bombs. Fourth, it should adopt regulations precluding the future use of window shade devices in belt systems and requiring that belts be designed to fit comfortably and safely on a wide range of wearers, thus precluding any excuses for slack as a "comfort" feature.

The likelihood that NHTSA will undertake any of these steps is virtually nil unless Congress requires them. The agency's

intransigence toward safety progress was demonstrated recently in its refusal to require full front seat air bags in future new cars, despite NHTSA's own evidence that the air bag-seat belt combination is vastly superior to other restraint systems. Last week, Congress did what NHTSA should have done by enacting air bag requirements as part of the Transportation Bill - a sad commentary on the "safety" agency's behavior.

Further, NHTSA has refused even to require that shoulder belts be equipped with adjustable anchorage points. Such anchorage points allow a wide range of users to position their belts across their upper torsos rather than across their faces or necks. They are found on some cars as standard equipment. They would add only pennies to the cost
of the car. They would make an important contribution to safe belt performance. Yet NHTSA recently rejected a petition to require them because, it found, they would not be cost effective and their safety benefits were "uncertain".

Auto safety regulation is in industry hands. NHTSA since 1981 has been headed by a series of totally unqualified, totally uncommitted bureaucrats whose apparent chief concern is pleasing the companies instead of protecting the public. They have squelched efforts by members of the agency's professional staff to move forward with needed safety standards and defect recalls, thus seriously demoralizing and frightening those members. Two of NHTSA's leadership bureaucrats have left to become paid witnesses on behalf of car companies in cases brought on behalf of people

injured by defective automobiles. One of them heads an industry coalition to oppose fuel economy improvements. The incumbent has attacked safety advocates as not credible and "lunatics".[17]

The motoring public may believe that because an agency called the National Highway Traffic Safety Administration exists in Washington, auto safety regulation is in good hands. Nothing could be further from the truth. Auto safety is in dangerous hands. The motoring public is needlessly in peril and will stay that way until NHTSA's leadership is overhauled and its auto safety mission is restored to its original course.

1. National Highway Traffic Safety Administration, National Traffic and Motor Vehicle Safety Act of 1966, Title 15.

2. Supreme Court Decision, Motor Vehicle Manufacturer's Association v. State Farm Mutual Automobile Insurance Company, June 24, 1983.

3. National Highway Transportation Safety Administration, Advance Notice of Proposed Rulemaking Docket 87-08;Notice 1, 52 Federal Register 22818, June 16, 1987.

4. Senate Commerce Committee, Report, June 23, 1966.

5. National Highway Transportation Safety Administration, Final Rule Docket 87-08; Notice 3, 54 Federal Register 25275, June 14, 1989.

6. See, for instance, the References in the National Transportation Safety Board, "Safety Study - Performance of Lap Belts in 26 Frontal Crashes", NTSB/SS-86/03, July 28, 1986.

7. Starting with Garrett v. Ford Motor Company, 684 F. Supp. 407 (Md. 1987).

8. National Transportation Safety Board, "Safety Study - Performance of Lap Belts in 26 Frontal Crashes", NTSB/SS-86/03, July 28, 1986.

9. See, for example, Snyder, R.G., "The Seat Belt as a Cause of Injury", Marquette Law Review. 1970 and Walz, F., Zollinger, U., Niederer, P., "Ejection And Safety Belts", Accident Analysis and Prevention, 1979.

10. Correspondence between Swedish Division of Volkswagon and Swedish Department of Transport (TSV), 1977-1981.

11. 49 C.F.R. 571.209.4.1.1.

12. H.R. 2950, the Intermodal Surface Transportation Infrastructure Act of 1991.

13. See, for example, Op. cit., p.5. See also Viano, D.C., "Cause and Control of Automotive Trauma", 64 Bulletin of the New York Academy of Medicine 376, 1988.

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14. For example, Baird v. General Motors Corporation, case no. C84-2874A, United States District Court Northern District of Ohio Eastern Division and Lundin v. General Motors Corporation, case no. 880377B in the U.S. District Court.

15. McCarthy, R.L., Padmanaban, J.A., Ray, R.M., "An Analysis of Safety-Related Impact of 'Comfort Feature' Introduction in GM Vehicles", 33rd Annual Proceedings Association for American Automotive Medicine, 295, 1989.

16. Vernick, Jon S., Kumbar, William J., Kelley, Benjamin, "Factors Affecting Seat Belt Use in Windowshade Equipped Vehicles: A Critical Analysis", August 4, 1991, in press and Robertson, L.S., "Shoulder Belt Use and Effectiveness in Cars with and without Windowshade Slack Devices", 32 Human Factors 235, 1990.

17. Automotive News, September 16, 1991.

Institute for Injury Reduction
Hearing Testimony,
December 4, 1991

Attachment No. 1

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Statement of Benjamin Kelley,
Institute for Injury Reduction:

REDUCING AUTOMATIC SEAT BELT HAZARDS

April 23, 1991
Upper Marlboro, Md.

On behalf of the Institute's members and the Center for Auto Safety, which has joined us in this press conference, thank you for being here.

Starting in 1986 the U.S. Department of Transportation, through its National Highway Traffic Safety Adminstration (NHTSA), began requiring front-seat automatic restraint systems in new cars. The requirement, Federal Motor Vehicle Safety Standard 208, was phased in starting that year and now applies to all new cars.

The requirement has been a two-edged blade, cutting deaths and ries with one edge while increasing crash hazards with the other.

On the beneficial side, FMVSS 208 permits manufacturers to equip their cars with driver-side or full-front-seat air bag systems plus manual lap-shoulder belts. That combination has been recognized for years as providing the best possible level of crash protection, especially in the higher-speed frontal impacts which account for the majority of deaths and serious injuries. On the detrimental side, the standard also permits manufacturers, if they do not want

ovide air bags, to equip their cars with the hazard-prone alternative - the automatic belt system.

Even though air bags account for a relatively small share of the automatic restraint systems provided in new cars to date, NHTSA evaluations of their real-world crash performance indicate that if full-front-seat air bags were in all passenger cars, vans, light trucks and utility vehicles, more than 7,000 deaths and 80,000 injuries would be prevented annually. (IIR Testimony, March 21, 1991, Senate Commerce Committee Consumer Subcommittee, hearings on S. 591.)

It bears repeating that air bag technology - the very kind now being praised by Lee Iacocca and provided by many companies in at least some cars - has been feasible, economical and marketable since the early 1970s. It was solely because of the industry's resistance, both to implementing improving crashworthiness technology and to regulatory proposals for requiring it, that air bags were pulled off the market in 1976 and kept off until a few years ago.

The Supreme Court called the industry's campaign of resistance "the regulatory equivalent of war against the air bag". More than one million Americans have been fatalities or seriously-hurt casualties in it.

A principal weapon in that war has been the automatic, or so-called passive, seat belt. Committed to undermining federal air bag requirements in the 1970s, the car companies developed automatic belt designs and presented them to the public, Congress and NHSTA

as a way to increase crash protection without providing air bags. Regulators modified their proposed "passive restraint" rules to permit automatic belts. We have asked you here today to review the results of that decision and to urge that it be rescinded.

In a moment we will describe for you the various automatic belt designs and demonstrate their hazards, which also are summarized in the attachment, "What Is Hazardous About Automatic Belts?" (Attachment 2) These hazards and the injuries they produce are well known to researchers, government officials and, of course, the companies themselves, as shown in "Some Background Facts." (Attachment 3)

One principal hazard stems from the door-mounted design of many automatic belt systems, that is, they are anchored so that when the door opens, the belt opens, permitting the occupant to be fully or partially ejected. Since doors open in an estimated 10 percent of crashes, the resulting exposure to severe or fatal injuries for door-mounted belt wearers is substantial - and avoidable.

Another major hazard is that many automatic belt designs either do not provide any kind of lap belt, or provide only a manual lap belt which requires as much effort to put on as the former, superior three-point manual designs commonly found n cars for the past decade or so. The "shoulder-only" design can cause very severe or fatal injuries to the chest, heart, and upper spinal cord when occupants submarine under it because they lack lower-torso restraint. And, absent a lap belt, occupants can submarine or roll out of these belts, leading to injuries from impacting interior

objects or from ejection.

Early in the development of passive restraints it was believed that even though the performance of automatic belts might be inferior to manual three-point belts, their deficiencies would be offset by the increased belt use they would generate. That argument no longer is sufficient, nor has it been for some years. One recent North Carolina study showed that use rates for manual belts, with or without air bags, have become nearly identical to those for automatic belts, and that the latter were more often worn incorrectly and dangerously.

The passage of State mandatory belt use laws has been the chief driving force behind increased belt wearing, and it behooves auto manufacturers and the government to see that all occupants, both restrained and unrestrained, are given the best protective system possible. That system is the air bag combined with the manual lap-shoulder belt.

To eliminate automatic belt hazards and insure the best restraint protection possible for the widest number of motorists, we are today making the following recommendations for action by government and the car companies:

1. DOT/NHTSA - Initiate rulemaking to preclude all automatic belt designs that embody the two principal hazards found in these systems, i.e., door mounted belts and shoulder-only belts.

2. DOT/NHTSA - Open investigations to determine the frequency and severity of injuries being permitted or caused by hazardous design characteristics of automatic belt systems, including door

mountings, shoulder-only designs, high-mounted hardware, and motorized operations - and issue recall notices for those systems found to be hazardous.

3. DOT/NHTSA - Publish consumer-information data showing the comparative injury and fatality reduction performances of air bag/manual belt systems and automatic belt systems based on real-world crash experience to date.

4. DOT/NHTSA - Initiate rulemaking to require full front seat air bag/manual belt systems in all new cars for the future. (If NHTSA fails to take this clearly and urgently needed step, Congress has readied legislation, S. 591, to do so.)

5. Auto Manufacturers, DOT/NHTSA - Issue clear warnings to prospective purchasers, owners and users of cars equipped with automatic belts concerning their crash hazards, including labels and other informational materials specifically describing the nature of injuries that can be caused by absence of a lap belt and/or ejection during a crash or rollover.

We in the auto safety movement have been asking motorists to "buckle up" for many years. It is only right that those same motorists, now that they are buckling up in very large numbers, be given safe belts, and the best overall restraint systems, to do it with.

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'AUTOMATIC' SEAT BELTS:

SOME BACKGROUND FACTS

Performance

High NCAP Crash Test Failure Rate: Each year NHTSA's NCAP program crash-tests new cars in 35 MPH frontal barrier impacts to determine injury levels for front-seat occupants. For the 1991 model year NHTSA has tested 40 cars representing 68 models.

Twenty two of the cars tested were equipped with driver-side "automatic" belts; five failed the test. The remaining 18 cars were equipped with driver-side air bags and manual 3-point belts; only one failed. (1991 New Car Assessment Program Results, NHTSA, 3/21/91)

* * *

HLDI 'Best and Worst': The latest HLDI insurance data for injury claims frequency reports that of the twenty passenger car models with the lowest overall frequencies, five were equipped with driver-side or driver/passenger side air bags. Of the twenty cars with highest injury claims frequencies, four were equipped with 'automatic' belts and only one with a driver-side air bag. The remainder in both groups had manual belts. (Highway Loss Data Institute, "Insurance Injury Report I89-1," September 1990)

* * *

Manual Belts More Effective When Worn: According to a 1988 NHTSA "Research Note," manual belts in compared cars were 40-50 percent effective in reducing fatalities when worn, compared to 35-38 percent for two-point door-mounted 'automatic' belts. (National Highway Traffic Safety Administration Research Note, "Reduced Fatality Rates in Toyota Cressidas With Automatic Belts," May 1988)

* * *

Effectiveness Limits: Although wearing rates for VW "automatic" belts prior to State mandatory use laws were at least double those for manual VW belts, fatality rates per vehicle month for the former were only 20 percent lower than for the latter. (NHTSA Research Notes, "Volkswagen Restraint Systems and Fatality Rates," February 1990)

* * *

Two-Point Shoulder Belts Not Permitted in Europe: The European Economic Community is among those jurisdictions that does not permit cars to be equipped with two-point shoulder-only belts, whether automatic or manual. That is, the automatic belt system sold in this country in large volumes by Volkswagen may not be sold in that manufacturer's own market. (EEC Council Directive 77/541, as amended)

Shoulder-Only Dangers

'People Won't Use Lap Belt': Ford, Chrysler, and most foreign manufacturers have chosen "automatic" shoulder belts that require the wearer to buckle a lap belt. GM has not, "mostly because people would tend not to use the additional lap belt." (Mike Rains, GM systems manager for restraints, quoted in Law and Order magazine, March, 1991.)

* * *

Two-Point Shoulder Belt Injuries Known Since 1968: "In our tests, the subjects received fatal trauma. This [shoulder-only belt] system not only does not provide pelvic restraint, which allows the subject's lower torso to swing forward and rotate out of the belt at impact (unless stopped by striking the instrument panel, car door, or other structure), but in side impact produces an extremely lethal whipping action in which the body literally rotates about and out of the belt. There have been several studies of injuries attributed to this type of belt - including data on chest injuries, a ruptured spleen, and sternal fracture." (Pathology of Trauma Attributed to Restraint Systems in Crash Impacts, Richard G. Snyder, PH.D., et al, Aerospace Medicine, August, 1968)

* * *

'Don't Use Shoulder-Only Belts': "However, we must [illegible] against those advocating the use of the single diagonal only (with no lap belt) as an adequate seat belt system...the results to date do indicate strongly that this can be a highly dangerous device." (Seat Belt Injuries in Impact, Snyder et al, Federal Aviation Administration AD 698 289, March, 1969)

'Use' Argument

'Increased Use' Rationale Fading: An early defense of "automatic" belts was that even though they might provide less protection than manual belts, this would be offset by the increased wearing levels they would generate. But a University of North Carolina study has found that for recent-model cars (1986 and later), belt use rates for "automatic" belt cars are roughly the same as those for manual-belt cars and air bag cars - 79.6 percent, 73.9 percent and 76.3 percent, respectively. ("Usage Patterns and Misuse Rates of Automatic Seat Belts by System Type," Highway Safety Research Center, University of North Carolina, October 1990)

* * *

Misuse A Greater Problem With 'Automatic' Belts: The same study found a "distressing" level of misuse for automatic belts, including excessive slack, disconnection, belts under arms, and failure to connect the manual lap belt. ("Usage Patterns and Misuse Rates of Automatic Seat Belts by System Type," Highway Safety Research Center, University of North Carolina, October 1990)

Ejection Dangers From Automatic Belts

Ejections More Common: When the doors of a vehicle open in a crash, the risk of occupant ejection is greater for vehicles equipped with automatic seat belts than for those equipped with manual belts. A 1988 NHTSA Research Note stated that "the Toyota [automatic] belts reduced ejections [compared with non-belt use], but probably not to the same extent as three-point manual belts." (National Highway Traffic Safety Administration Research Note, "Reduced Fatality Rates in Toyota Cressidas With Automatic Belts," May 1988)

* * *

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Commonness of Door Opening in Crash: "Data from [Insurance Institute for Highway Safety] investigation...indicate that latches opening and tearing off are a frequent occurrence in towaway crashes. Trained investigators examined each vehicle in detail. They found that 10 percent of the vehicles had experienced door opening during the crash and an additional 2.3 percent had door latches torn away from their mounting...Clearly, more than one out of ten is too high a rate of door and latch failures." (Motor Vehicle Crash Injury Patterns and the Virginia Seat Belt Law, Lestina et al, Insurance Institute for Highway Safety, 1990.)

* * *

GM Knew: "During a 30 mph lateral dolly rollover test conducted using the FMVSS 208 test procedure, a passive shoulder belt restrained, 50%tile dummy initially positioned in the outboard front seating position on the low side of the vehicle was completely ejected from the passenger compartment. We believe this result demonstrates that a belt type pelvic restraint must be combined with the passive shoulder belt to provide the same degree of occupant protection during rollover accidents as the current active lap-shoulder belt system provides." ("General Motors Corporation Response to the Department of Transportation Proposal on Occupant Crash Protection," OST Docket 44, Notice 76-8, September 17, 1976)

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WHAT IS HAZARDOUS ABOUT
AUTOMATIC BELT DESIGNS?

Automatic belt designs vary. The following list points out the chief designs and, where applicable, their hazards:

1. Two-Point Door-Mounted: Found on many Volkswagen vehicles manufactured during the mid-1970s to early 1980s, and again since 1985. Also found on Hyundai vehicles manufactured during the late 1980s. Hazards include the following:

-No Lap Belt: This allows forward motion of the lower body in a crash. Also allows the body to submerge from or roll out of the belt system, depending on the crash configuration, which may lead to injury from impact with internal structure or ejection through windows or sunroofs. Can produce serious or fatal injuries to the chest, heart and upper spinal column from "hanging" injuries caused by the shoulder-only design.

-Door-Mounted: If the door opens in a crash or while the vehicle is in motion, the occupant may be ejected since the belt is fastened to the door and no lap belt is provided to prevent even partial ejection.

-Door-Mounted Hardware: The belt release hardware is mounted at the top of the door, where in a crash it is vulnerable to impact from outside objects or objects in the [illegible] which can trigger the belt release mechanism and leave the occupant unbelted. Also, the rigid, unyielding hardware itself, located near the wearer's head, becomes an injurious structure in a crash.

2. Three-Point Door-Mounted: Found on many General Motors vehicles manufactured since 1985, as well as some Japanese vehicles. Hazards include the following:

-Door-Mounted: If the door opens in a crash or while the vehicle is in motion, the occupant may be ejected since the belt is fastened to the door.

-Slack: Some systems are equipped with "windowshade" tension relievers which induce slack into the system, further negating the belt's effectiveness in a crash.

Four-Point Automatic Shoulder/Manual Lap: Shoulder belt motorized in some, not in others. Favored by manufacturers not using the above designs, including most Japanese manufacturers. Hazards include:

-Non-Automatic Lap Belt: Widely left unused by occupants who may think that are "automatically" protected by the shoulder portion, leaving them exposed to crash injuries associated with two-point shoulder-only belts.

-Door-Mounted, Motorized: Some designs are door mounted; if the door opens in a crash or while the vehicle is in motion, the occupant not wearing a lap belt may be fully ejected since the shoulder belt is fastened to the door. Motorized systems may be designed to trigger the shoulder belt to open when the door opens, which creates a similar hazard for non-door-mounted motorized systems. Even occupants wearing their manual lap belts are exposed to partial (upper torso, head) ejection by these designs.

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EXCERPTS, CALSPAN REPORT, 2/91,
PREPARED FOR U.S. DOT/NHTSA:
"ON-SITE AUTOMATIC BELT INVESTIGATION"
FATAL AUTOMATIC BELT EJECTION CRASH,
BRUNSWICK, ME., 9/30/91"

(Contract No. DTNH22-87-C-07169)

"This crash occurred on a four lane roadway in Brunswick, Me., on Sunday, September 30 at 1531 hours...The involved vehicle was a marked Brunswick Police 1990 Chevrolet Caprice 4-door sedan that was equipped with a 3-point automatic lap and shoulder belt system...affixed to the front door. ...the driver was apparently in pursuit of a vehicle...The left rear door area of the Caprice impacted a utility pole..." (Summary, p. 1)

"Due to the B-pillar failure and the opening of the left front door, the 3-point automatic belt system that was affixed to the door no longer restrained the driver. He was ejected through the door opening and impacted the asphalt sidewalk with the right parietal aspect of his head, resulting in a skull fracture with multiple underlying [fatal] cerebral injuries." (Summary, p. 2)

"The door-mounted automatic 3-point lap and shoulder belt system did not provide sufficient restraint for the driver due to the striker post separating from the B-pillar which caused the door to open, thus creating an avenue for his nearly complete ejection from the vehicle." (Summary, p. 2)

"The Maine State Police, who investigated this fatal crash, have subsequently retrofitted all of their 1990 Chevrolet Caprice police vehicles (122 vehicles) with the 1989 active 3-point belt system affixed to the left B-pillar." (p. 16.)

USAGE PATTERNS AND MISUSE RATES OF AUTOMATIC SEAT BELTS BY SYSTEM TYPE

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USAGE PATTERNS AND MISUSE RATES OF AUTOMATIC SEAT BELTS BY SYSTEM TYPE

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ABSTRACT

This study examined seat belt usage by drivers of 4151 late model cars in North Carolina equipped with a variety of restraint system types. Of special interest was the usage of shoulder and/or lap belts for both motorized and non-motorized automatic seat belt systems. For comparison purposes, data were also collected on usage rates for three-point manual systems. Usage rates are provided by restraint type (automatic belt, air bag, manual belt), by make/model and by driver characteristics (age, sex and race). Highest usage rates (79.6%) were found for automatic belts followed by traditional manual belts (76.3%) and restraints provided in air bag-equipped cars (73.9%). Although the shoulder belt was utilized in 94.2 percent of the motorized belt cars such as the Ford Tempo and Toyota Camry, the accompanying lap belt was fastened in only 28.6% of these vehicles. Among the automatic belt systems, the non-motorized automatic lap/shoulder combination, such as used by General Motors and Honda, was the least frequently utilized (76.9%). Misuse of the shoulder belt (e.g., excessive slack, detached from the door, placed under the arm) was found in nearly six percent of the sample. As a result of this survey along with one conducted by the US DOT, it would appear that increased public information and education concerning these new restraint systems is warranted.

SEAT BELTS have now been required in passenger vehicles for over two decades; lap belts were required in 1966 and lap and shoulder belts in 1968. The early lap and shoulder belt systems were not connected (a four-point system), but interconnected lap/shoulder belts (a three-point system) became standard in 1974. Through the early 1980's, however, U.S. seat belt use rates were

approximately 10-15 percent, so that the vast majority of motor vehicle occupants were electing not to use their available restraints.

In 1974 an ignition interlock system was required on all new cars, such that they would not start unless the driver lap/shoulder belt was engaged. However, this system was so unpopular that Congress also repealed the interlock rule effective February 1975.

The knowledge about design and implementation of air bags in motor vehicles has been available for several decades, yet movement to require these automatic devices has been quite slow. Many highway safety specialists feel that the protracted arguing between seat belt and air bag advocates over which system should be preferred was a major factor in holding down the seat belt use rate in the U.S. thus maintaining the status quo from around 1975 till 1984. This dichotomy did not exist in Europe and Australia, and many of these countries had high belt use rates in the 1970's and 1980's.

Tennessee became the first state to pass a child passenger safety law in 1977, and many states followed suit over the next few years. By 1985 all 50 states had such a law in place. This activity may have helped to initiate the movement that was to come in regard to adult belt laws.

In 1984, Federal Motor Vehicle Safety Standard (FMVSS) 208 was amended to promulgate the use of automatic protection in motor vehicles. A phase-in was set up such that all cars manufactured during the 1990 model year and later would be required to have some form of automatic protection that would meet federal crash test requirements. The four-year phase-in took place in the following manner: 10% of all 1987 model year cars sold in the U.S. were required to have automatic protection; 25% of 1988 model year cars; 40% of 1989 model year cars; and 100% of all 1990 model year cars.

During the early-to-mid 1980's, the auto manufacturers began promoting the passage of mandatory belt use laws (MUL's), no doubt aided by the prospect of possibly not having to meet the automatic protection phase-in schedule if two-thirds of the U.S. population were covered by adequate MUL's. In 1984, New York became the first state to require belt use by drivers and front seat occupants. By the end of 1985, fifteen additional states plus the District of Columbia had passed mandatory use laws. Although there have been repeals of MUL's by four states, as of April 1990 there were belt laws in 33 states plus the District of Columbia that covered more than 85 percent of the U.S. population.

Although much of the U.S. population was covered by belt laws, the federal government on other grounds declined to overturn the amendment to FMVSS 208 that required the automatic protection phase-in. Initially the majority of vehicles with automatic restraints were

equipped with automatic seat belts. Now there is an increased production of driver air bags which will eventually also include right front-seat passenger air bag systems. These air bag restraint systems are supplemental systems designed to activate in frontal and frontal oblique collisions only. Therefore, it is important for the three-point manual seat belts to be used by air bag-equipped automobile drivers.

Relatively little is known about the usage of automatic seat belts by the population-at-risk or the effectiveness of these systems in crashes. The same can be said with respect to the effectiveness of the supplemental air bag systems in reducing deaths and injuries. In 1981, Chi and Reinfurt reported on a study involving some 10,336 Volkswagen Rabbits involved in crashes. The dataset consisted of both manual restraint system Rabbits as well as automatic shoulder belt/knee bolster restraint Rabbits. They concluded that the automatic belt Rabbits experienced between 20 and 30 percent fewer serious and fatal injuries than their counterparts in Rabbits with conventional three-point belt systems. The overriding factor for this reduction was the increase (at least two-fold) in the belt usage rates in the automatic belt Rabbits. This study concluded that, when used, the two belt systems are equally effective in reducing serious injuries.

More recently, Nash (1989) reports on the effectiveness of automatic belts in reducing fatality rates in Toyota Cressidas. Comparing Toyota Cressidas equipped with motor-driven automatic belts since 1981 with similar Nissan Maxima's equipped with three-point manual belts and using data from the Fatal Accident Reporting System, he concluded that the fatality reduction effectiveness for the Toyota automatic belts is approximately 40 percent. This is consistent with the existing estimates of the effectiveness of manual restraint systems in fatality reduction (Partyka, 1988).

Automatic seat belts are available in three basic designs. VW produced the first automatic belts in its 1975 Rabbit models. These consisted of two-point shoulder belts attached to the upper rear of the front door and connected to a take-up reel located between the front seats. Lower body restraint was provided by a knee bolster since no lap belts were provided. These belts were detachable but an ignition interlock was installed to encourage usage.

With the 1981 Cressida, Toyota introduced a second design which is a two-point motorized automatic belt system. The belt is a motor-driven, non-detachable automatic shoulder harness. Also included are manual lap belts along with a knee bolster.

The third type of automatic belt used extensively by General Motors and Honda is a three-point non-motorized belt mounted near the upper and lower rear edge of the front door of the vehicle. There are variations on

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these basic systems, such as the two-point automatic shoulder belt along with a manual lap belt found in all 1990 VW's.

Again, as the majority of automatic belt systems are detachable and also are not accompanied with ignition interlock systems, relatively little is known about the acceptance of these systems by the motoring public. The usage in crashes reported by Chi and Reinfurt (1981) suggested usage rates for the automatic belts roughly two-fold that of the manual belts -- at least in VW Rabbits. The estimates ranged from 17 to 42 percent for manual belts versus 43 to 74 percent for automatic belts based on crash data from New York, North Carolina, Maryland and Colorado.

With respect to belt usage in the population-at-risk, a study conducted by Williams, Wells, Lund and Teed (1989) showed significantly higher belt usage rates for drivers with automatic restraints compared with manual belts. Additionally, there were differences with regard to lap belt use among the various automatic systems. The data were comprised of 1987 model year vehicles observed in different suburban areas of Washington, D.C., Chicago, Los Angeles, and Philadelphia. The authors concluded that some manufacturers were indeed more successful than others in providing automatic belt systems that result in high usage rates.

The most extensive study to date was conducted in conjunction with the NHTSA's annual belt survey in 19 cities (Bowman and Rounds, 1989). As an add-on to their regular national survey of belt usage across the United States, information was collected during 1987 and 1988 on a total of 21,308 drivers in automatic belt passenger cars. The results from this study provide usage rates by type of automatic belt systems by manufacturer and make/model. Comparisons are made with manual belt usage and also by model year groups. Results are limited to shoulder belt usage only because the cars observed were not necessarily stopped. In addition, these results are strictly for urban vehicles and do not include information on driver characteristics such as age, race, and sex.

To close some of these gaps in the data, the Highway Safety Research Center collected belt use data in cars equipped with automatic belts, along with air bag and manual belt vehicles (as a baseline). The goal was to provide knowledge about whether some belt systems were more acceptable (i.e., used) than others, and whether drivers with air bags actually use their available belts. Comparisons are made with the U.S. DOT 19-city survey where appropriate.

METHOD

To obtain data on the use of restraints in cars equipped with automatic restraints (lap/shoulder belts

and/or air bags), supplement 'ata were ollected as part of an on-going statewide bel. se survey for North Carolina. Data were collected in January-February, 1989, June-July, 1989, and January-March, 1990. Observers were sent to signal- or stop-controlled intersections scattered across the State, both in rural and in urban locations. The requirement for signal- or stop-controlled intersections was to enable the data collectors to correctly ascertain lap belt use -- an essential ingredient of this survey.

Starting with model year 1986, passenger cars have been required to have center, high-mounted rear brake lights. And starting with the 1987 model vehicles, some of the new cars were also required to have automatic restraints -- either air bags or automatic seat belts. Thus, the observers focused on cars with the center, high-mounted brake lights with the exception of VW Rabbits, which have had a portion of their vehicles equipped with automatic belts since model year 1975. Since only 10 percent of the 1987 model year cars were required to have automatic restraints and 25 percent of the 1988 models, the data collectors were trained to recognize the various makes and models likely to be equipped with automatic restraints by visiting automobile dealer showrooms and studying the available literature. However, the data were not restricted only to air bag or automatic seat belt vehicles, as information was needed for new model vehicles equipped only with manual belts which would serve as baseline data.

The data collectors worked in pairs at these various controlled intersections. One observer recorded age, (under 25, 25-54, 55 and older), race (white, non-white), and sex of the driver; belt type (e.g., motorized automatic shoulder belt vs. manual three-point system); and usage of the lap and of the shoulder belt. In addition, this observer recorded misuse which included the belt being unhooked from the mounting position, excessive slack, or the shoulder belt placed under the arm of the driver.

The second observer, positioned toward the rear of the vehicle, first determined that there was a center, high-mounted brake light present or else that the vehicle was a VW Rabbit and hence an eligible vehicle, recorded the license plate number for cars with North Carolina license plates and provided a description of the car, namely, the make and model as well as body style (e.g., two-door vs. four-door vs. station wagon). The description of the vehicle was necessary to confirm the subsequent match with the North Carolina vehicle registration data since, when there is a vehicle transfer, the license plate stays with the owner. Thus, there is a period of time after this transfer when the old plate is on the new vehicle but the registration file information has not yet

been updated. Therefore, to guarantee that the observed license plate corresponds to the vehicle data on the registration file, this additional description of the car was required. Data on belt use for a total of 4820 cars were collected during these three sampling periods.

To determine the type of restraint system installed in the vehicle, it was necessary to obtain the vehicle identification number (VIN). This is available on the North Carolina registration file for all cars registered in the State. Thus, each of the observed license plate numbers was checked against the vehicle registration file. If the description of the vehicle agreed with that on the registration file, then the VIN from the file was recorded for that vehicle. Otherwise it was necessary to exclude that vehicle from the study. Of the initial 4820 cars observed, some 4225 vehicles (or 87.7%) matched the data on the registration file, and hence had appropriate VIN's.

Using VINDICATOR, the VIN-decoding software package developed by the Insurance Institute for Highway Safety (IIHS), the sample VIN's were decoded to obtain restraint type. The resulting levels of restraint type provided by this program are manual three-point belts, air bags, or automatic seat belts. Some 4151 VIN's were decoded using the VINDICATOR package (i.e., 86.1% of the original sample).

As with the U.S. DOT study, there was particular interest in the types of automatic seat belts -- the motorized two-point belts, the non-motorized shoulder belt only, and the non-motorized three-point (i.e., automatic shoulder/automatic lap combination) belt. In order to provide this level of detail, the make/model and model year information from the VINDICATOR program was used, along with detailed documentation on specific type of automatic belt system provided annually by NHTSA, IIHS, and also Geico Automobile Insurance Company.

Thus, the final study sample consisted of belt usage by system type for 831 drivers with manual three-point belts, 230 with air bags (along with three-point manual belts), and 3,090 with automatic seat belts. Of these 3,090, there were 413 motorized automatic shoulder/manual lap belts, 148 non-motorized automatic shoulder belts, 2,518 non-motorized automatic shoulder/automatic lap belts, and an additional 11 non-motorized belt with type unknown.

RESULTS

The distribution of the study sample of 4,151 drivers of late model passenger cars is shown in Table 1 by restraint type system. The majority (74.4%) of the sampled vehicles had automatic seat belts, 5.5 percent had air bags with manual three-point belts and the remaining 20.1 percent had manual three-point belts without air bags. As

there were only 21 cars with non-motorized automatic shoulder/manual lap belt system (e.g., 1990 model VW Jetta), they were combined with the more common automatic shoulder belt only system (e.g., VW Rabbit). The column identified as "Shoulder Belted %" represents drivers where the shoulder belt was in use. The next column, labeled "Correct Usage %" indicates that the entire system was being used appropriately. As will be seen, the main instance of misuse was when there was a manual lap belt that was not buckled. The final column presents the results from the US DOT 19-city survey of driver automatic belt use rates (see Bowman and Rounds, 1988).

Table 1 - Percent Shoulder Belted and Percent Correctly Restrained by Restraint Type

Restraint Type	Total	Shoulder Belted %	Correct Usage %	19 City Shoulder Belted %
Auto Belt	3090	79.6	68.8	88.7
Motorized:				
Auto S/Manual L	413	94.2	28.6	97.2
Non-Motorized:				
Auto S	148*	83.8	75.7	81.3
Auto S/Auto L	2518	76.9	74.9	76.9
Type Unknown	11	90.9	81.8	--
Air Bag	230	73.9	73.5	
Manual Belt	831	76.3	73.8	
Overall	4151	78.6	70.0	

*148 = 127 (Auto S) + 21 (Auto S/Manual L)

It should be noted that in both the air bag cars and the manual belt cars, shoulder belt usage percentages correspond to usage of three-point manual belts provided by these vehicles.

For the full sample, there was at least a shoulder belt used in 78.6 percent of the cases. When looking at "correct usage," the percentage drops to 70.0 percent. This rather high usage is partly due to the observations focusing on new model cars (basically 1986 and later model years) and also the sampling being carried out in North

Carolina where belt usage in the population has been approximately 60 percent for the last several years.

Results of applying Pearson's Chi-square test indicate that there is a significant difference in "shoulder belted" usage rates among drivers of vehicles equipped with automatic belts, manual belts, or air bags (Chi-square = 7.5, df = 2, p = 0.02). Shoulder belt usage is highest for drivers with automatic belts (79.6%) compared with 76.3 percent for manual belts and 73.9 percent for air bags. Within the automatic restraint systems, there is also a significant difference in "shoulder belted" usage rates (Chi-square = 67.7, df = 3, $p < .001$). The generally non-detachable motorized systems have the highest usage rates, namely 94.2 percent. This was followed by the automatic shoulder belt system with 83.8 percent, and, somewhat lower at 76.9 percent, the three-point automatic shoulder belt combined with the automatic lap belt as is commonly found in General Motors and Honda vehicles.

A special feature of this study was the determination of not only shoulder belt usage but also lap belt use. This is particularly important in cases where the lap belt must be fastened separately, such as in the Toyota Camry and Cressida and the Ford Tempo and Escort. As is seen in Table 1, in the case of the non-motorized automatic shoulder/automatic lap belt, generally when the belts are used, they are used correctly (76.9% vs 74.9%, respectively). For the non-motorized automatic shoulder belt systems, the drop from 83.8 percent belted to 75.7 percent correctly belted is mainly attributable to the 21 vehicles for which the lap belt must be buckled manually (e.g., 1990 model VW Jetta).

For the increasingly popular motorized automatic belts where the shoulder belt is motor-driven and a separate lap belt must be manually attached, there is a 70 percent decline in correct usage going from 94.2 percent usage (i.e., "Shoulder Belted %") down to 28.6 percent where the lap belt is also manually attached (i.e., "Correct Usage %"). Often motorists would tell the data collectors that "they just forget to buckle the lap belt" or that "they didn't know that they had a lap belt." For whatever the reason, it is clear that the drivers with the motorized shoulder belts are most often neglecting to use the important manual lap belt. See Figure 1 for usage rate comparisons across restraint types.

Comparing the second and final columns of Table 1, it is of interest to note that the results from the urban DOT study are relatively similar to those found in North Carolina. Again, highest shoulder belt use rates (97.2% DOT vs 94.2% N.C.) were seen with the motorized automatic belts and lowest for the non-motorized automatic shoulder/automatic lap belt combination (identical at 76.9%).

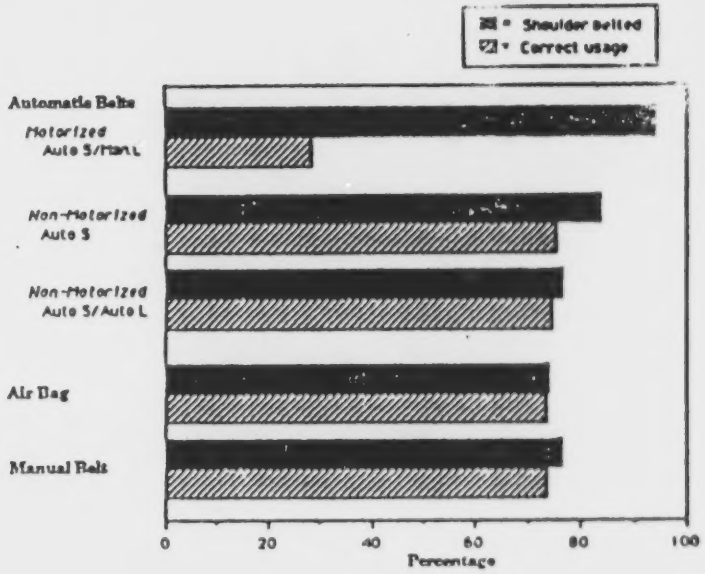

Figure 1. Percent Shoulder Belted vs Percent Correctly Belted by Restraint Type

Note was made by the observers of obvious misuse of the shoulder belt portion. Categories of misuse included (1) belts that were unhooked from the door mounting, (2) shoulder belts with obvious excessive slack (i.e., being "too loose" with at least six inches of extra belt webbing) and (3) shoulder belts worn under the arm. The most common form of misuse was the shoulder belt being "too loose." In 3.0 percent of the cases (i.e., 126 drivers), there was obvious excessive slack in the shoulder belt. In an additional 1.5 percent of the cases, the driver was wearing the shoulder belt underneath the arm. And in another 1.3 percent of the cases, the driver had detached the shoulder belt from the door mounting. Thus, overall nearly six percent of the drivers observed in this survey were wearing their shoulder belt incorrectly.

The next two tables deal with belt use by car manufacturer and by make and model within automatic belt type. For the most part results are limited to those subgroups with reasonable sample sizes.

Table 2 displays belt usage by restraint type across manufacturer. First, for each manufacturer, the percentage distribution by restraint type is given. For example, in our survey 21.6 percent of the Chrysler products had automatic belts and 19.8 percent had air bags with the

Table 2 - Belt Usage by Restraint Type
Across Manufacturer

Restraint Type	Manufacturer (%)*	Total	Shoulder Belted %	Correct Usage %
Auto Belt				
Motorized	Chrysler (21.6)	35	82.9	37.1
	Ford (61.1)	181	94.5	26.0
	Toyota (93.1)	122	96.7	28.7
Non-Motorized	VW (97.0)	98	87.8	87.8
	GM (91.8)	2337	76.9	74.8
	Honda (72.6)	193	77.7	76.7
None	Mercedes (0)	--**	--	--
	Volvo (0)	--	--	--
Air Bag				
	Chrysler (19.8)	32	68.8	68.8
	Ford (9.5)	28	78.6	78.6
	Toyota (.76)	--	--	--
	VW (0)	--	--	--
	GM (.08)	--	--	--
	Honda (3.8)	10	50.0	50.0
	Mercedes (80.2)	93	68.8	68.8
	Volvo (21.9)	40	90.0	90.0
Manual Belt				
	Chrysler (58.6)	95	71.6	70.5
	Ford (29.4)	87	72.4	69.0
	Toyota (6.1)	--	--	--
	VW (3.0)	--	--	--
	GM (8.2)	208	80.3	76.0
	Honda (23.7)	63	77.8	76.2
	Mercedes (19.8)	23	69.6	69.6
	Volvo (78.1)	143	80.4	79.7

*Restraint type percent within manufacturer.
**Cell size < 10

remaining 58.6 percent having only manual belts. Consistent with the previous table, the first three listed automatic belt manufacturers (i.e., Chrysler, Ford and Toyota) have high shoulder belt use rates ranging from 83 percent to 97 percent. However, too often the manual lap belt is not being used resulting in a sizable decline to a.

"correct usage percentage" ranging from 26 percent to 37 percent.

Although the shoulder belt usage rate for the non-motorized automatic belt is lower than that for the motorized system, these systems are much more likely to be correctly used. Here the range in usage of the shoulder belt is from 77 percent to 88 percent with little decline for correct usage, namely 75 percent to 88 percent.

For the air bag cars as well as the manual belt cars, the usage rates of the three-point belts are somewhat lower but there is very little difference between the percentage indicated as shoulder belted versus having the entire belt system used correctly.

Table 3 gives a further breakdown for the automatic belt systems for various make/model combinations and

Table 3 - Belt Usage by Type of Automatic Belt System for Various Make/Model Combinations

Restraint Type	Make	Model	Total	Shoulder Belted %	Correct Usage %	19 City Should. Belted %
Motorized:	Ford	Escort	105	93.3	27.6	97.7
		Tempo	40	97.5	27.5	97.7
	Toyota	Camry	78	98.7	24.3	99.3
		Cressida	42	92.9	35.7	99.6
Non-Motorized:						
Auto S	VW	Jetta	47	95.7	95.7	93.9
		Rabbit/ Golf	49	79.6	79.6	96.2
Auto S/ Auto L	Buick	LeSabre	315	85.4	83.8	76.9
		Regal	114	73.7	71.1	81.2
		Skylark	98	78.6	74.5	81.0
	Chev.	Beretta	150	67.3	62.7	76.9
		Corsica	87	71.3	70.1	81.8
	Olds.	Calais	170	70.6	68.2	67.7
		Cutlass	99	77.8	74.7	81.3
		Delta 88	254	81.5	80.3	77.0
	Pont.	Bonneville	195	81.0	80.5	79.4
		Grand AM	446	72.2	70.2	74.4
		Grand Prix	123	74.8	67.5	84.0
	Honda	Accord	110	72.7	71.8	75.3
		Prelude	68	83.8	83.8	67.0

compares the results of the North Carolina study with that done by U.S. DOT. Note the similarity in the results between the belted percent in North Carolina and the indicated belted percent for the 19-city survey. Except for the VW Rabbit/Golf, the percentages are most comparable between the two surveys. Part of the reason for this difference is that older model Rabbits with lower use rates are included in the North Carolina sample. Again all four motorized shoulder belt make/models show high shoulder belt usage, namely 92.9 percent to 98.7 percent, but with a dramatic decline when accounting for correct usage. Within the non-motorized belt categories, there is relatively little difference between make/model combinations other than for the VW Rabbit/Golf model. In addition, when used, the non-motorized systems are generally correctly used.

The final three tables deal with driver characteristics such as age, sex, and race. With respect to belt usage by type of system, overall frequencies and usage percentages by restraint type are given in the first row of each section of the table to serve as a baseline for comparison.

Belt use by driver age is shown in Table 4. As can be seen, the percentage of drivers of cars with automatic

Table 4 - Belt Use by Restraint Type
by Age of Driver

Restraint Type	Age	Total	Shoulder Belted %	Correct Usage %
Auto Belts		3090	79.6	68.8
	Under 25	343	74.6	57.4
	25-54	2016	79.9	69.1
	55 and over	731	81.3	73.2
Air Bags		230	73.9	73.5
	Under 25	9	66.7	66.7
	25-54	162	75.3	75.3
	55 and over	59	71.2	69.5
Manual Belts		831	76.3	73.8
	Under 25	55	83.6	78.2
	25-54	562	74.4	72.2
	55 and over	214	79.4	76.6

seat belts using at least the shoulder belt (i.e., "Shoulder Belted %") is lowest for the youngest drivers. For air bags and manual belts, the small sample sizes limit drawing conclusions for the younger drivers. Within restraint type, the range of percentage of drivers buckled

up among the various age group is from seven to nine percent for automatic belts and manual belts, respectively. The decline in percentages when accounting for correct usage is generally greater for the younger drivers, dropping to below 60 percent correct usage for those younger drivers in automatic belt cars.

Table 5 provides results of belt usage by restraint type according to driver sex. The sample is split 44/56

Table 5 - Belt Use by Restraint Type by Sex of Driver

Restraint Type	Sex	Total	Shoulder Belted %	Correct Usage %
Auto Belts		3090	79.6	68.8
	Male	1371	79.4	69.3
	Female	1719	79.8	68.4
Air Bags		230	73.9	73.5
	Male	125	71.2	70.4
	Female	105	77.1	77.1
Manual Belts		831	76.3	73.8
	Male	413	70.2	68.8
	Female	418	82.3	78.7

by sex (male/female driver). Shoulder belt usage is higher for female drivers in both the air bag cars with three-point manual belts and in the manual belt cars -- namely some six to 12 percentage points higher. This is consistent with many surveys dealing with belt usage by driver sex. Similar comments apply to the "correct usage" percentages by driver sex. For the automatic belt category, both the percentage of drivers using at least shoulder belt as well as the percentage of drivers correctly using their available belt system are about the same for both male and female drivers.

Finally, Table 6 examines belt use by driver race. In North Carolina, since the seat belt law with a $25 citation went into effect in January 1987, the wearing rates of non-white drivers has consistently been slightly greater than that for their white counterparts. In this survey of new model cars, the wearing rates for the non-white driver are lower in both the air bag cars and the manual belt cars. They are slightly higher, however, in the automatic belt vehicles. For all three restraint types, the percentage of drivers correctly using the available restraint systems is higher for the white driver ranging from nearly five to eight percentage points higher.

Table 6 - Belt Use by Restraint Type
by Race of Driver

Restraint Type	Race	Total	Shoulder Belted %	Correct Usage %
Auto Belts		3090	79.6	68.8
	White	2737	79.4	69.6
	Non-white	353	81.3	62.0
Air Bags		230	73.9	73.5
	White	217	74.2	73.7
	Non-white	13	69.2	69.2
Manual Belts		831	76.3	73.8
	White	719	77.1	74.5
	Non-white	112	71.4	68.8

DISCUSSION

Since all 1990 model year cars are required to be equipped with passive restraints (e.g., automatic seat belts or air bags) following a gradual phase-in which started in 1987, and since relatively little is known about public acceptance of these new devices, an opportunity was seized upon to capture data on driver belt usage for new model cars in North Carolina. This survey was carried out in conjunction with our periodic statewide survey of belt use being done to help evaluate our mandatory use law.

For the most part, the sample of 4,151 drivers were driving 1986 and later model year cars selected on the basis of having center, high-mounted brake lights. Some 74.5 percent of the sample were in automatic belt cars with 20.0 percent in cars equipped with manual three-point belts and the remaining 5.5 percent in air bag cars with manual three-point belts.

Shoulder belt usage rates for all systems (automatic belts 79.6 percent, air bags 73.9 percent, manual belts 76.3 percent) considerably exceeded the statewide average of approximately 60 percent largely because these vehicles are nearly all new model cars. Within the automatic belt group, usage was highest (94.2 percent) for the motorized automatic shoulder/manual lap belt system, intermediate (83.8%) for the non-motorized system with automatic shoulder belts and lowest (76.9%) for the non-motorized automatic shoulder/automatic lap belt system.

The results seen in North Carolina are quite consistent with the 19-city U.S. DOT survey rates of 97.2 percent, 81.3 percent, and 76.9 percent, respectively. There are several features of this survey which are.

unique. First, data were collected on two types of automatic belt system misuse. The first type consisted of drivers not fully utilizing the restraint system available. The second kind of misuse dealt with misuse of the shoulder belt falling into categories of (1) belt being detached from the door mounting, (2) excessive slack in the belt, and (3) shoulder belt being placed underneath the arm. The other area in which this survey is unique is that it compares usage rates by various driver characteristics, namely, age, sex and race.

With respect to the first type of misuse, that is, failing to utilize the full restraint system provided, this problem was primarily experienced by drivers in vehicles equipped with motorized shoulder belts and manual lap belts such as the Ford Escort and Tempo and the Toyota Camry and Cressida. Here, there was a 70 percent decrease in "usage" (from 94.2% "shoulder belted" to 28.6% "correctly belted"). The corresponding drop in percentages for the other systems (non-motorized automatic belts as well as three-point systems available in both the air bag cars and in the manual belt cars) was relatively minor -- generally, only several percentage points.

The most common form of incorrect usage was having too much slack in the shoulder belt (3.0% of the sample) followed equally by the belt being detached from the door mounting (1.3%) and the shoulder belt being placed underneath the arm (1.5%). These rates of misuse totaling nearly six percent are very consistent with that which has been observed in the North Carolina statewide surveys of all cars regardless of belt system or model year.

With respect to driver age, the younger driver (under 25) had lower usage rates than other age groups except for the case of manual belts. The lower rates for the younger driver are certainly consistent with past seat belt surveys conducted in the U.S. The decline accounting for correct usage is likewise greatest for the under 25 year old with only 57.4 percent of the younger drivers correctly using their automatic belts.

As has been seen in other surveys, females tended to wear manual three-point belts more frequently than males ranging from six to 12 percentage points higher. Female usage of automatic belts is most comparable with that of the male drivers. Likewise, their usage of the full restraint system (i.e., "Correct Usage %") is higher in the air bag cars and in the manual belt cars than that of male drivers.

In our North Carolina surveys covering cars of model years 1968 and never, belt usage has consistently been higher for non-white drivers than for white drivers since implementation of the North Carolina seat belt law in January 1987. In this survey involving never model cars, belt usage for non-white drivers was generally somewhat lower in the air bag and manual belt cars. For all three

restraint systems, "correct" usage rates for non-white drivers were lower than that for their white counterparts.

Several points bear mentioning. First, more and more cars are being produced with motorized shoulder belt systems. It is disturbing that fewer than 30 percent of the drivers observed in this survey were getting the full protection available which included buckling the lap belt. Sometimes this was likely a result of ignorance while perhaps more often it was the result of not developing the special habit required. Evidently, having the motorized belt fall into place gives drivers of these cars the feeling of being buckled up. Clearly, additional educational efforts are warranted in this situation.

Secondly, it is distressing to note that the three-point non-motorized automatic belt systems were defeated nearly 25 percent of the time. Motorists indicate that it is very easy to disconnect these systems and often if they elect to use them, they use them as manual belts; in other words, they disconnect them as they get out of the car and reconnect them once they have entered the car for the next trip. It would seem clear that usage rates of approximately 75 percent for these non-motorized automatic shoulder/automatic lap belt systems is below what was anticipated.

On an encouraging side, it is good to see relatively high usage of the three-point manual belts in air bag cars (namely, 73.9%). Clearly air bags are designed to be supplemental systems in that they do not protect the occupant in many crash modes such as side impacts or rollovers. From data collectors talking with many drivers in air bag-equipped cars, it was clear that many did appreciate the fact that they needed to use the manual three-point belts. However, some drivers were not even aware that their car was equipped with air bags. Clearly, as more and more air bag cars are produced, public information and education with respect to utilizing the manual belts will become increasingly important.

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ABOLISH HAZARDOUS AUTOMATIC BELTS, REQUIRE AIR BAGS, SAFETY GROUPS URGE

UPPER MARLBORO, MD., April 23 - Two leading safety groups today urged that hazardous automatic seat belts be outlawed and in their place, air bag-manual belt systems be required in all future new cars. They backed up their demand by demonstrating that many automatic belt designs can allow their users to be ejected in collisions or rollovers.

The Institute for Injury Reduction, joined by the Center for Auto Safety, made the demand at a public showing today of automatic belt dangers. Using General Motors, Hyundai and Volkswagen cars, IIR demonstrated what it termed a "principal hazard" of many such belts, which is the risk of ejection to belted occupants when doors open in crashes.

Many GM and other automatic belt systems are door-mounted, meaning they leave the wearer unprotected in door-opening collisions and rollovers.

Air bags with manual belts, which are mounted to the car's body, would eliminate this and other hazards, an IIR official said. The air bag-manual belt combination "has been recognized for years as providing the best possible level of crash protection, especially in the higher-speed frontal impacts which account for the majority of deaths and serious injuries," said Benjamin Kelley, IIR's president.

Kelley pointed out that according to government and private studies, doors open in an estimated 10 per cent of all injury-producing crashes, meaning that belt protection against ejection in such crashes is "crucial and essential".

Other automatic-belt hazards described by IIR included fatal and paralyzing injuries to the upper torso, head, and upper spinal cord caused by two-point shoulder belts without lap belts - injuries which have caused such designs to be outlawed in Europe.

IIR and CAS called on the U.S. Department of Transportation to initiate investigations and rulemaking to eliminate hazardous automatic belts and require air bag-manual belt systems in all new cars. If the Department "fails to take this clearly and urgently needed step," Kelley noted, "Congress has readied legislation, S. 591, to do so."

CALSPAN ON-SITE AUTOMATIC BELT INVESTIGATION
CALSPAN CASE NO. 91-7
FLEET - 1988 FORD ESCORT GT
LOCATION - LILBURN, GA

PRELIMINARY SUMMARY

The crash occurred on a four lane divided (painted flush median) highway in Lilburn, GA. on Saturday, June 1, 1991 at 1420 hours. At the time of the crash, the asphalt road surface was wet due to a light rain. A witness reported that several minutes prior to the crash it was raining at a moderate to heavy rate and that rain water was running down the concrete gutters located on each side of the roadway. The north/south bound roadway had a negative grade of 3.1% to the south. The posted speed limit was 45 mph.

This investigation focused on a 1988 Ford Escort that was equipped with automatic, motorized 2-point shoulder restraints and manual lap belts in the left front and right front seated positions. The shoulder belt webbing extended from an inertia reel retractor that was located at the inboard side of the front seat cushion in the center console area. The webbing was affixed to a nondetachable bracket that rode on a track which began at the upper third of the A-pillar, extended along the side rail, then down onto the upper third area of the B-pillars. As an occupant would enter the vehicle, the belt was retracted forward to the A-pillar. With the door closed and the ignition switch turned to the on position, the belt is motored rearward across the occupant's outboard shoulder to a locked position on the B-pillar. The occupant must then fasten the active 2-point lap belt which retracts at the outboard side of the front seat and buckles at the inboard side adjacent to the center console. Warning labels are permanently affixed to the sun visors advising occupants of the importance of lap belt usage.

The 1988 Ford Escort GT, 2 dr. hatchback, with a V.I.N. of 1FAPP9137JT and an odometer reading of 56,841.5 miles was traveling in a northerly direction on the inboard travel lane at a police reported speed of 40-45 mph. The 30 year old male driver of the vehicle lost control of the Ford Escort on the wet road surface. The vehicle initiated a counterclockwise yaw and rotated across the center left turn lane and into the inboard southbound travel lane. A 1987 Honda Accord LXi, 4 dr. sedan, was traveling southbound on the inboard lane at a police estimated speed of 35-45 mph. The vehicle was occupied by a 34 year old male driver, a 5 year old right front occupant, a 33 year old left rear occupant, and a 3 year old right rear occupant. All occupants of the Honda were wearing the active 3-point lap and shoulder belt systems. The 3 year old right rear occupant was also seated in a child booster seat (make/model unknown). The driver of the Honda Accord probably braked in an attempt to avoid the Ford Escort. There were no skid marks visible on the wet road surface.

The Ford Escort rotated approximately 100-110° in a cw direction and into the path of the Honda. The full frontal area of the

Honda subsequently struck the right rear side area of the Ford Escort resulting in a 11:30/5:30 o'clock impact configuration. The damage to the Ford began at the right B-pillar and extended rearward to the bumper corner. Crush values measured at mid body level were as follows: C_1 = 21.0" (MAX crush), C_2 = 18.1", C_3 = 16.5", C_4 = 12.3", C_5 = 10.9", C_6 = 0.4". The Honda Accord sustained moderate damage distributed across the entire frontal structure of the vehicle with a maximum crush value of 18.4" that was located at the right corner of the front bumper. Crush values at bumper level were as follows: C_1 = 2.6, C_2 = 6.8", C_3 = 10.1", C_4 = 13.0", C_5 = 15.3", C_6 = 16.4". The damage algorithm of the CRASHPC program computed velocity changes of 15.8 mph for the Ford Escort and 14.1 mph for the Honda.

The front to side impact configuration rotated the Ford Escort rapidly in a clockwise direction across the outbound southbound travel lane. The vehicle overrode a 6" barrier curb and climbed a landscaped embankment before coming to rest perpendicular to the roadway. The vehicle rotated approximately 385° cw from its impact to final rest positions. The Honda came to rest at or near the point of impact. The lateral component of its impact force (PDOF of ~15°) displaced the vehicle to its right. At rest, the vehicle had rotated approximately 25° CW from its initial heading.

The 30 year old male driver of the Ford Escort was restrained by the automatic shoulder belt. He was not wearing the active lap belt. The lap belt was found (at the time of vehicle inspection) fully retracted to the outboard side of the left front seat. There was no damage to the lap belt system and the latchplate did not yield evidence of routine usage (scratches). A witness to the crash observed the driver in the vehicle with the shoulder belt across his body. The witness further stated that the driver was not wearing the active lap belt. In response to the lateral impact force, the driver initiated a lateral trajectory to his right as the vehicle rotated out from under him. He loaded the automatic shoulder belt which produced vertical striations on the inside surface of the belt webbing. His right hip and thigh area loaded the side surface of his seat cushion and the center console, displacing the console 5" to the right. Scuff marks on the console and center armrest evidenced the contact area. The driver's right lower leg impacted the forward left side of the console. A scuff mark continued across the console and onto the center message system display. His right arm probably contacted the center mid instrument panel, producing scuff marks below the air conditioning vents. Driver injury data was not available at the time of our investigation. The driver came to rest rotated in a clockwise direction with his torso partially between the front seat backs. He complained to the witness that the shoulder restraint was too tight and asked him to cut the belt. The witness subsequently retrieved a knife and handed it to a woman (passerby) who cut the shoulder belt 18.4" below the track attachment bracket. The remaining belt retracted into the center mounted retractor. The driver remained in the vehicle and was removed by rescue personnel. He was transported to a local hospital and admitted for treatment of his injuries.

The right front passenger of the Ford Escort (driver's wife) was also restrained by the automatic shoulder belt. She was not wearing

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the manual lap belt. The latchplate of the lap belt system contained only a few scratches which indicated that the belt was seldom worn. The displaced center console concealed the buckle assembly for the right front lap belt, making it impossible to release the buckle had the belt been worn. The webbing assembly was found partially extended from the retractor (10.75"). Police or the Medical Examiner probably tested the belt during their inspection of the vehicle.

The impact force locked the inertia retractor for the passenger's automatic shoulder restraint. She initiated a lateral trajectory to her right and loaded the shoulder belt webbing with her right neck area. Her loading force against the belt webbing caused the belt to become taut. The passenger's head began to move toward the right door window opening (glass probably shattered by vehicle deformation) which stressed the belt webbing. The belt webbing contacted the rear vertical window frame which produced a diagonally orientated abrasion to the painted surface. The 1" wide abrasion extended 4.5 - 6.5" above the top surface of the door panel. The passenger's right knee impacted the right mid instrument panel between the glove box and the right door. The contact probably resulted in an abrasion (AIS-1) of the knee. Her right leg contacted the leading edge of the door panel parcel tray and the door window crank. Both components exhibited fabric transfers and the window crank was compressed into the door panel. The passenger's right hip and thoracic areas loaded the door mounted armrest (fabric transfers) and upper door panel. Her loading force against the door panel bowed the panel and door structure 2.25" outward. The bowing of the door deformed the door latch release arm that extends from the inside release lever to the latch assembly. As a result, the door latch released and the door opened. The inside door latch release lever was found extended in the open position. The latch plate catch assembly was also found in the open position and could not be closed due to the door deformation.

As the occupant loaded the door and the door subsequently opened, the vehicles were still engaged in their impact positions. The passenger continued to move laterally to her right and fully loaded the shoulder belt webbing with her right neck area. The taut belt webbing abraded the occupant's neck in a semi-circular pattern that extended from the posterior midline forward to the right to the anterior midline area. The belt subsequently cut into the neck and severed the neck resulting in a complete decapitation at the C_7 - T_1 level (AIS-6).

The passengers torso loaded the automatic shoulder belt webbing as it continued to move laterally. The belt abraded and contused the passenger's right anterior chest, left anterior chest, and left arm (AIS-1) as her body was ejected through the door opening. The passenger's body came to rest immediately forward of the right front corner of the Honda Accord. There was no contact between the body and the Honda. Numerous abrasions occurred to the body as it contacted the road surface before coming to rest. Blood spatters were also found on the right front wheel of the Honda and probably occurred during the early ejection sequence of the body. The decapitated head was ejected from the vehicle and came to rest at the curb, forward of

The right front automatic shoulder belt remained in the rearward position as the door opened. Vehicle deformation deformed the motoring track assembly as the belt retracted 3.25" forward from its full locked position. Occupant loading on the belt webbing produced two vertical striations that extended 12.25 - 16" below the motorized track attachment bracket. The striations were located on the inside (occupant side) surface of the belt webbing and paralleled the edges, .375" inboard of the edges. Using the naked eye, what appeared to be tissue transfers were visible on the outside surface of the belt webbing 6.625 - 11.75" below the track attachment bracket. Using an 6 power magnifying lens, multiple tissue fragments were visible and embedded into the woven pattern of the belt webbing. The Medical Examiner cut two samples from the belt webbing and several others from interior components to test for tissue and blood typing.

A thorough inspection of both vehicles, separated components, and internal loose objects failed to identify an alternate mechanism for the decapitation. The right upper B-pillar also shielded the occupant from the possible contact with the frontal surface of the Honda.

Photographs of both vehicles, the police report, and autopsy report are included with this summary as attachments.

CALSPAN CORPORATION

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CALSPAN ON-SITE AUTOMATIC SEAT BELT INVESTIGATION

CASE NO. 90-17

FLEET - 1990 CHEVROLET CAPRICE
(BRUNSWICK, ME POLICE)

LOCATION - BRUNSWICK, ME

ACCIDENT DATE - SEPTEMBER 30, 1990

Contract No. DTNH22-87-C-07169

Prepared for:

U.S. Department of Transportation
National Highway Traffic Safety Administration
Washington, D.C. 20590

CALSPAN ON-SITE AUTOMATIC SEAT BELT INVESTIGATION

CALSPAN CASE NO. 90-17

FLEET - 1990 CHEVROLET CAPRICE
LOCATION - BRUNSWICK, ME

SUMMARY

This crash occurred on a four lane roadway in Brunswick, ME, on Sunday, September 30 at 1531 hours. At the time of the accident the road surface was wet due to light rain. The involved vehicle was a marked Brunswick Police 1990 Chevrolet Caprice 4 door sedan (VIN: 1G1BL54Z71A149146) that was equipped with a 3-point automatic lap and shoulder belt system. The lap belt and shoulder belt were mounted on inertia reel retractors that were affixed to the front doors. The latchplate is detachable from the buckle as this type of system is typically used as an active system instead of automatic.

The Caprice was traveling in an easterly direction on the inboard travel lane at an unknown rate of speed. The driver was apparently in pursuit of a vehicle and was traveling with his overhead lights and siren activated. As he approached the accident scene, a noncontact vehicle entered the roadway from a parking lot driveway located at the north (left) roadedge. The noncontact vehicle initiated a left turn into the eastbound travel lanes. The driver of the Caprice swerved into the right (outboard) travel lane in an attempt to avoid contact with the other vehicle. The driver of the noncontact vehicle continued into the right eastbound lane in front of the police vehicle. The driver of the Caprice swerved to his left and entered the left eastbound lane. He again applied a clockwise steering input as he successfully avoided the noncontact vehicle. Due to the wet road surface and the rapid steering inputs, the vehicle initiated a clockwise yaw as it crossed into the right travel lane.

The Caprice mounted the 5" barrier curb that paralleled the travel lanes resulting in damage to the left front wheel. The curb impact probably enhanced yaw of the vehicle as it departed the roadway in a near broadside orientation. The left rear door area of the Caprice impacted a utility pole that was located 1'5" outboard of the curb. Impact speed was computed at 32.7 mph by the damage and trajectory mode of the CRASH3 program. The 9 o'clock direction of force impact (PDOF-80°) crushed the left rear door to a maximum depth of 37.3". The damage was vertically uniform from the sill to the roof side rail. The CRASH3 program computed a velocity change of 25.5 mph with a lateral component of 25.1 mph. The impact, having occurred rearward of the vehicle's center of gravity, reversed its rotation to a counterclockwise direction. The left front fender area of the vehicle subsequently impacted a concrete reinforced steel post that was mounted in a landscaped island bordered by railroad ties. The subsequent impact crushed the left front fender to a maximum depth of 16.4" located 13.6" forward of the left front axle. The vehicle came to rest fully engaged with the utility pole and guard post, facing in a southeasterly direction.

The initial utility pole impact displaced the left B-pillar both laterally and rearward approximately 5.6". The pillar displacement exerted a force load on the latch and strike assembly of the left front door. The door itself was not damaged by the impact. The latch and strike post remained closed; however, the strike separated from the B-pillar.

The B-pillar was manufactured from a double layer of sheetmetal with an approximate 1" diameter hole bored mid stream in the lower pillar for attachment of the latch strike assembly. The B-pillar end of the strike was threaded into a steel reinforcement bracket that was 3" in length x 1.625" in width x .125" (1/8") in thickness. The reinforcement bracket was placed into the pillar through the 1" diameter hole. The strike post was then backed by two 1.5" diameter (outside diameter) washers. The impact force deformed the reinforcement bracket to a U-shape which allowed the bracket to pull through the B-pillar creating a jagged hole that measured 2.5" vertically x 1.75" horizontally. As a result of the strike post separating from the B-pillar the left front door opened.

The driver of the Caprice was a 29 year old male, 67" in height and 165 lbs. He was wearing the "automatic" 3-point lap and shoulder belt system. Restraint usage was supported by a blue belt webbing transfer on his service revolver holster that he wore on his right hip and by heavy loading marks on the lap belt webbing. The loading marks consisted of grooved marks that extended from 12-27.5" above the latchplate. The grooved marks paralleled the edges of the webbing. The driver moved laterally to his left and initially loaded the left front door panel. His contact with the door fractured the plastic armrest panel and bowed the upper surface of the door outward 0.75". The extent of the door opening was probably restricted by the inertia reels of the lap and shoulder belt webbing. The driver began to rotate in a clockwise direction as he moved laterally to his left. His rotation was probably initiated by the equipment on his utility belt (revolver holster, ammo clip, and handcuff case) as it snagged the lap belt webbing, and his probable gripping of the steering wheel rim. Due to the B-pillar failure and the opening of the left front door, the 3-point automatic belt system that was affixed to the door no longer restrained the driver. He was ejected through the door opening and impacted the asphalt sidewalk with the right parietal aspect of his head, resulting in a skull fracture with multiple underlying cerebral injuries.

The driver came to rest on his back with his feet resting on the left corner of the seat cushion. The door was fully opened and he was in a prone position, lying on his back. The first officers who arrived on scene found him in this position with the 3-point belt system securely buckled. The driver was lying between the left front door and the B-pillar with the belt webbing extending over the anterior aspect of his lower legs.

The driver was transported by ambulance to a local hospital. He was later transferred to a major medical center where he expired on October 1, at 1845 hours.

The door mounted automatic 3-point lap and shoulder belt system did not provide sufficient restraint for the driver due to the strike post separating from the B-pillar which caused the door to open, thus creating an avenue for his nearly complete ejection from the vehicle.

GENERAL MOTORS CORPORATION
RESPONSE TO
THE DEPARTMENT OF TRANSPORTATION
PROPOSAL ON
OCCUPANT CRASH PROTECTION

OST DOCKET 44, NOTICE 76-8

SEPTEMBER 17, 1976

D. Passive Shoulder Belt Performance

For reasons which are discussed later in this paper a passive shoulder belt appears to be the only currently known passive belt system which is both potentially acceptable to at least some consumers and capable of meeting the proposed test requirements. Unfortunately, there is far too little publicly available data concerning the passive shoulder belt restraint system's performance in accidents to permit making an effectiveness estimate for this system. The 22 accident cases presented at the January 27, 1976 National Motor Vehicle Safety Advisory Council meeting are the only ones of which we are aware involving such a restraint concept. However, our testing indicates that such restraints may have significant performance limitations. These tests were conducted using an experimental passive shoulder belt installed in a GM sub-compact vehicle.

Two potential problems should be discussed here. During a 30 mph lateral dolly rollover test conducted using the FMVSS 208 test procedure, a passive shoulder belt restrained, 50%tile dummy initially positioned in the outboard front seating position on the low side of the vehicle was completely ejected from the passenger compartment. We believe this result demonstrates that a belt type pelvic restraint must be combined with the passive shoulder belt to provide the same degree of occupant protection during rollover accidents as the current active lap-shoulder belt system provides.

The second concern is the loading of the dummy's lower abdomen by the passive shoulder belt. This occurred during a simulated 30 mph, 90° car-to-car

side impact with the dummy seated on the "far side." Unfortunately, there is no way of assessing the potential for injury using the current test technology. However, we believe this loading pattern to be potentially serious during severe side impacts, because of the possibility of damage to internal organs. Lap or lap-shoulder belts, in contrast, apply restraint forces to the pelvic structure.

Even if these concerns about the possible performance limitations of such systems are not supported by the field accident data when it becomes available, we would still have reservations about the appropriateness of depending on a knee impact surface instead of a lap belt to provide lower torso restraint. We cannot be sure, for example, that a knee impact surface used in conjunction with a passive shoulder belt will adequately protect an out-of-position occupant, a small adult, or a child occupant in frontal or angular accidents because the performance of such a system is highly dependent on the spacing between the knee and the knee impact surface. This spacing is affected by the seat location and the occupant's leg orientation as well as the length of his upper leg.

Based on these considerations, we have concluded that it would be necessary to combine an active lap belt with the passive shoulder belt to provide occupant protection equal to that provided by use of active lap shoulder belts over the full range of accident conditions.

Although we have a number of practical reservations about the passive belt concept (some of which are discussed in a later section), we reiterate our proposal in D. E. Martin's December 8, 1975 letter to Dr. J. B. Gregory that the NHTSA institute a

study of passive belt field accident data in a manner similar to that already being followed to evaluate air cushion restraint systems. We believe such a study is a necessary step towards determining the technical acceptability of such systems and would be an appropriate project for the Federal Government to undertake.

KEY DOCUMENTATION OF NHTSA'S
VIEW OF 'WINDOWSHADE' BELTS

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1. March 3, 1973

NHTSA letter to GM: Expresses "concern about possible reductions in shoulder belt effectiveness due to excessive belt slack." Says comfort clips, which regulate the amount of slack, are permissible.

2. Nov. 8, 1973

NHTSA letter to American Safety Equipment Corp: "As we understand the concept of a tension reliever, it allows a small amount of slack to be introduced into the webbing..."

3. Dec. 16, 1976

NHTSA Advance Notice of Proposed Rulemaking, Docket No. 74-14, Notice 7: States that the tendency of window shade retractors "to permit excessive slack in the upper torso portion [of the belt] is an argument against permitting their use." Suggests that improving belt comfort and convenience might increase belt use.

4. April 22, 1977

GM letter to NHTSA in Docket 74-14, Notice 7: Extensively disagrees that comfort and convenience factors influence belt use, impact of comfort and convenience on use is "largely unknown," disagrees with NHTSA that "improved comfort and convenience would increase belt usage." Also says NHTSA proposals to set comfortable levels of belt tension across the wearer's chest, which GM opposes, would be "a de facto mandate of mechanical tension relievers." Asks that "any belt retraction test procedures" adopted by NHTSA exclude the use of tension relievers because they are "user controlled operations".

5. January 1979

Examination of Comfort and Convenience of 1979 Safety Belt Systems, study carried out for NHTSA (DOT HS-8-01984). Finds that "systems with windowshade devices have more incomplete retraction and excessive slack problems than belts without windowshade devices.... Since excessive slack reduces the protection to the wearer, a safety problem is indicated." Also

6. June 1979

...ct of FMVSS 208, Comfort and Convenience, on Vehicle Manufacturing, study carried out for NHTSA (DOT HS-9-02110). Study is an in-depth evaluation of NHTSA's proposed standards for increasing comfort and convenience, eliminating some design hazards. NHTSA's requirements would require better shoulder belt fit for a wider range of body sizes and a controlled level of belt pressure on the occupant.

"Tension Reliever: Because currently produced comfort clips and window shade type devices to relieve pressure of the shoulder belt often allow excessive and dangerous slack in the shoulder belt, these devices should not be employed. Allowable tension relievers should perform so that the belt remains in contact with the occupant at all times." The proposed standard would prohibit (?) such devices.

Study finds that a number of GM belt systems, as well as those of other manufacturers, are in non-compliance with the proposed standards but could easily be brought into compliance by the 1981 model year. Concludes that $2.91 would be saved by dropping the windowshade device from GM belt designs.

7. Dec. 31, 1979

NPRM, Docket 74-14, Notice 17: "...this notice proposes to eliminate manual or automatic devices that allow the introduction of slack in the belt webbing of an upper torso belt." Also, "the agency is particularly interested in possible performance requirements or test procedures to measure and limit the amount of slack that can be introduced in the belt webbing by such devices."

8. April 1, 1980

...letter to NHTSA in 74-14, Notice 17: Opposes NHTSA's proposed ...fort and convenience" standards because "information that is available is contrary to the NHTSA contention that the lack of comfort and convenience in today's belt systems is the cause of low use and that the proposed regulation will increase usage."

However, also opposes NHTSA plan to forbid windowshades: "...General Motors believes that a tension relieving device, such as the windowshade device, is a highly desirable part of a seat belt system from a comfort standpoint and is necessary to make the belt system acceptable to the greatest number of users." (p. 9)

9. April 1, 1980

MVMA letter to NHTSA in 74-14, Notice 17: "Experience shows that such features as...tension relieving devices...which already have been incorporated into belt systems to improve comfort and convenience have not resulted in significant increased usage."

10. January 8, 1981

Final rule, 74-14, Notice 19: "Windowshade" or "other tension relieving devices can reduce the effectiveness of belts in crash situations if the occupant uses the device to put excessive slack in the belt webbing, i.e., so that the belt is not snugly against the occupant..."

Requires that automatic belts equipped with windowshades must meet the dynamic crash test criteria with the belts extended to the greatest amount of slack enabled by the windowshade. Since manual belts will be phased out in the near future under NHTSA's then-effective passive restraint rule, they are not required to meet the dynamic test criteria. However, "the agency does urge manufacturers to voluntarily limit the amount of slack that can be introduced in their manual belt systems..."

11. March 9, 1981

GM petition for reconsideration of the final rule: Asks that the windowshade belt requirement be limited to the amount of slack present in "normal use," i.e., that recommended by GM, rather than any slack enabled by the device. "...there is no practical way to completely eliminate all possibility that misuse of a tension relief device, or any other device intended for occupant use, will occur. Further, it is doubtful that a vehicle occupant will use excess slack, willfully introduced from misuse of a tension relief device, as a means of defeating his restraint system." No mention is made of inadvertent introduction of slack.

12. October, 1981

NHTSA delay, revocation of passive restraint rule: Although this action guarantees that manual belts will remain the predominant front-seat restraint systems for years to come, it includes no prohibition or limiting of windowshade devices in such belts. (?)

13. August 25, 1981

Patent 4,285,479: Patent to inventor Hubert P. Blom, assigned to General Motors, covers a device which would deactivate the windowshade at forces lower than the decelerative forces necessary to lock the retractor, thus negating the worst feature of the windowshade.

14. February 18, 1982

NHTSA response to GM and other petitions for reconsideration of portions of the final rule in 74-14, Notice 19: NHTSA postpones its

effective date until September 1, 1983. It later (Nov. 15, 1982) extends this delay to September 1, 1985.

15. April 12, 1985

NHTSA Notice of Proposed Rulemaking in 74-14, Notice 37, response to petitions: Acknowledges that windowshades "can reduce the effectiveness of belts in crash situations where excessive slack has been introduced in the belt webbing." Finds that for some designs a windowshade device is needed "so that a small amount of slack can be introduced in order to move the belt webbing off the occupant's neck" when the anchorage has been placed to cause improper belt fit.

The notice proposes to remove the requirement for testing of automatic belts with windowshade devices, in dynamic impacts, with the belt slack at the greatest amount enabled by the device, and calls for a warning in the operator's manual against excessive slack. It seeks data and comments on "the potential effect that tension-relievers may have on belt effectiveness and belt usage."

16. July 17, 1984

NHTSA Final Rule in Docket 74-14, Notice 36: Responding to a Supreme Court decision, reinstitutes a passive restraint standard to begin phasing in on September 1, 1986. This insures that manual lap-shoulder belts in front-seat positions will be standard in millions of new cars, including those with air bags, for many years to come.

17. April 12, 1985

NHTSA Notice of Proposed Rulemaking in 74-14, Notice 38: Acknowledges that windowshade create the possibility of excessive slack resulting in "unsafe levels of this forward movement" which could occur for restrained vehicle occupants," which "increases chances of occupant contact with potentially hostile interior surfaces."

Proposes to require dynamic tests for manual belts, but to allow slack to be set to "amount...that is recommended by the manufacturer for the shoulder belt under normal use conditions in accordance with the instructions in the owner's manual."

18. May 28, 1985

Letter from GM to NHTSA in 74-14, Notice 37: Commends NHTSA for allowing crash tests of windowshade belts with the "device adjusted as recommended in the owners manual...i.e., occupant usage of tension relief in the intended manner."

Yet admits that "There is no doubt that belt slack, even if minimal and consistent with the manufacturers' recommendations as well as the concept of 'normal usage,' does increase occupant excursion and the potential for higher values of Head Injury Criterion and chest G's than would be the case without belt slack."

Also admits that some GM belt designs "may dictate an anchor location that is not conducive to avoiding shoulder or neck irritation from the shoulder belt. This could be compensated for, at least in part, by tension relief features."

Claims that the windowshade device "is essential for maintaining high levels of belt use."

19. June 14, 1985

Letter from NTSB to NHTSA in 74-14, Notice 37: Objects strongly to NHTSA's proposal to allow testing of windowshade belts with only "recommended" slack rather than full slack.

"...many users who do not know how to use this system correctly introduce excess slack, and we believe the existence of instructions in the owner's manual is not a sufficient guarantee of proper use." In addition, "research has shown that it is possible inadvertently to introduce excessive slack in these belts through normal movements involved in operating a vehicle." And, "The Board believes that permitting additional slack in the shoulder belt is not an acceptable way to deal with belt geometry problems generated by poor anchor design and location."

20. November 6, 1985

NHTSA Final Rule, 74-14, Notice 42: Allows dynamic testing of windowshade belts with only slack recommended by the manufacturer. Defends windowshades as use promoting, but offers no evidence of use increases associated with windowshades; "Allowing manufacturers to install tension-relieving devices makes it possible for an occupant to introduce a small amount of slack to relieve shoulder belt pressure or to get the belt away from the neck. As a result, safety belt use is promoted."

Waives belt pressure limitations for systems equipped with windowshade devices, thus promoting the latter.

21. June 27, 1987

Insurance Institute for Highway Safety Report: Finds, in a survey of D.C. area vehicles, much higher levels of slack observed for belt wearers in cars likely to be equipped with "windowshade" devices than in those not likely to be equipped with such devices, i.e., domestically-made v. Japanese-made cars.

23. November 23, 1987

Final Rule, NHTSA docket 74-14, Notice 53: Again rejects pleas that windowshade belt systems be dynamically tested with the full amount of possible slack, and agrees with manufacturers to test with "recommended" slack. States, "the agency believes that the inadvertent introduction of slack into a belt system, which is beyond that for normal use, is unlikely in most current systems." Offers no evidence to support this belief. Describes the excessive slack problem as "misuse" rather than windowshade design.

24. March 1988

NTSB Report, Performance of Lap/Shoulder Belts in 167 Motor Vehicle Crashes: Recommends that NHTSA adopt standards requiring either than window shade belts be crash-tested at full slack under the FMVSS 208 dynamic test criteria, or that they be equipped with tensioners to eliminate the slack when a crash occurs.

25. August 2, 1988

Letter from NHTSA to NTSB: Rejects NTSB's recommendation because "we do not believe that a safety problem has been demonstrated for window shade devices..."

26. Feb. 17, 1989

Letter from NHTSA to IIR: Rejects IIR's request that NHTSA set standards precluding window shade devices; "We believe that the increase in belt usage encouraged by some comfort features will provide safety benefits." Criticizes IIR program to educate the public about the window shade's slack belt hazards: "...the practical effect of such a publicity campaign is to undermine public confidence in safety belts..."

27. July 11, 1989

NHTSA Final Rule, 74-14, Notice 61: Rejects petitions and requests that window shade devices be prohibited or discouraged by "full slack" dynamic crash test requirements. Characterizes the introduction of excessive slack in window shade belts as "misuse", and avoids discussion of inadvertent slack. Concludes that the "possibility of misuse is not a sufficient justification for

prohibiting devices that have the potential to increase safety belt use."

28. September 11, 1989

IIR letter to NHTSA: Encloses letters from IIR urging manufacturers to disengage window shade devices for safety-conscious motorists who do not wish to have the hazard of slack present in their belts. Asks NHTSA to take steps to accomplish that result, including publicity efforts and an investigation of window shade crashes.

29. October 13, 1989

NHTSA response to IIR: Notes that petitions for window shade recalls and rulemaking are pending before NHTSA. Does not respond to IIR's call for disengagement of window shades for requesting car owners.

30. December 8, 1989

NHTSA Denial of Petition: NHTSA rejects petition by Mark Goodson for an order to recall and correct window shade belt systems based on a crash in which a fatality was found by the County Medical Examiner's Office in Dallas to have been associated with the presence of a window shade. "Since these devices has been used widely over the past 15 years and the agency has explicitly permitted their use, there is no reasonable possibility that such an order would be issued at the conclusion of an investigation into this issue."

31. January 30, 1991

NHTSA Petition denial: Rejects a petition by Motor Voters to require adjustable upper seat belt anchorages to increase belt Safety and comfort by enhancing belt fit for a wide range of users. finds that the proposal, which would add about $1 to the cost of each lap-shoulder belt seating position, would not be cost effective. Calls on manufacturers to make "voluntary provision" of adjustable anchorages. Finds "no significant safety benefit" from such anchorages.

32. February 19, 1991

NHTSA Termination of rulemaking: Drops rulemaking to prohibit or restrict window shade devices. Finds "no demonstrated real-world problem resulting from the misuse of tension-relieving devices on safety belts." Adds that, "Even if there were some minimal negative safety effects, window shade type tension relieving devices will not be installed in any vehicles manufactured on or after September 1, 1991" under current manufacturer plans, so there is "no reason

to proceed with the rulemaking action..."

?? July 5, 1991

NHTSA Denial of petition: Denies request by The Institute for Safety Analysis seeking rulemaking and defect investigation activity to preclude window shade devices. Restates that because manufacturers have announced plans to discontinue window shades "by the end of the 1991 model year," no rulemaking is warranted.

Institute for Injury Reduction
Hearing Testimony,
December 4, 1991

Attachment No. 3

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New York Times
7/30/91
pg. A19

Air Bags for All Cars

By Joan Claybrook
and Benjamin Kelley

WASHINGTON

A chance to make public safety history — public health, really — comes to few people. Now it has come to Jerry Curry in the form of the air bag, which a few years ago the auto industry scorned.

Mr. Curry, Administrator of the National Highway Traffic Safety Administration, can ultimately prevent at least 7,000 deaths and 80,000 crippling injuries each year by ordering that front-seat air bags become available as standard equipment in all new passenger vehicles. He is flinching, because the Administration wants to let the industry to decide who does and doesn't get safe cars.

The agency administers the automatic crash protection rule, which requires manufacturers to install front-seat air bags or automatic belts in cars, and, under a rule change in March, in vans, light trucks and small buses beginning in late 1994.

Why is the safety chief dithering?

For years, auto makers opposed air bags as ineffective, dangerous, expensive and needless. During the early Reagan years, the highway administration rescinded the rule. At the behest of insurers and safety groups, the Supreme Court in 1983 ordered an end to "the regulatory equivalent of war against the air bag," and forced the agency to reissue the rule. The rule, phased in for 1987 to 1990 car models (vans and light trucks will be phased in between 1995 and 1998 models), gives each company the choice of providing air bags or a user-unfriendly — often unsafe — alternative, the automatic seat belt.

Despite the air bag's vastly superior performance, most new cars made and sold under the rule since 1987 have been equipped with automatic belts. Now, with five million cars equipped with bags on the road, it is clear the bags provide unique protection in frontal crashes. Not even auto industry officials dispute this; witness Lee Iacocca's turn-around from opponent to head cheerleader for the air bag, which Chrysler is promoting in most of its new cars.

Since Mr. Curry has not acted on a Congressional request to order air bags in new passenger vehicles, the Congress is poised to do so. The Senate recently passed the highway bill, which mandates front-seat air bags for the driver and passengers. Tomorrow, a House bill is to be introduced by Gerry Sikorski, Democrat of Minnesota, that contains vehicle safety requirements similar to those in the Senate highway measure.

Requiring air bags for all new vehicles would lead to important economies for the industry and motorists, for the greater and more predictable the volume of production, the lower the unit cost. Also, requiring them would heighten competition between manufacturers to produce superior systems. It has been known for years that air bags can provide incredible protection even in 40 to 50 mile per hour crashes — far above the current 30 m.p.h. standard — and can be designed to provide protection in side impact crashes.

Car companies, particularly Japan's, which have mostly resisted air bags, might oppose a Federal mandate. But Mr. Curry can rally a groundswell of consumer and insurance industry support for it. In a 1990 speech to the Society of Automotive Engineers, he stressed that his agency "alone is accountable" for making correct decisions about life and death in car crashes. If so, this boast leaves him no choice but to issue an all-air-bag rule. If he doesn't, Congress should act. □

Joan Claybrook, Administrator of the National Highway Traffic Safety Administration in the Carter Administration, is president of Public Citizen. Benjamin Kelley is president of the Institute for Injury Reduction.

NHTSA's "Estimated Safety Benefits from Air Bags" projects, on the basis of real-world crash experience with air bag-equipped cars already on the highways, that by 1995 some 18.25 percent of the U.S. passenger car fleet will be equipped with driver-side air bags and that 10.82 percent will be equipped with both driver and passenger-side air bags. (See Table 1, "Estimated Benefits of Air Bags, 1990-1995").

An extrapolation from those figures was carried out to estimate the reductions in deaths and injuries which would be realized were all cars on the highways equipped with driver and front passenger air bags, based on the fleet size assumed by NHTSA for 1995.

NHTSA's estimates for that year, based on 18.35 percent of the national passenger-car fleet being equipped with driver air bags and 10.82 percent with passenger air bags, were that a total of 879 fatalities and 10,597 injuries would be prevented. Multiplying those figures by factors reflecting the projected presence of driver and passenger-side air bags in all cars (5.45 and 9.24, respectively) produced the estimate of 5,368 fatalities and 63,590 moderate to serious injuries prevented.

This estimate would be higher by at least 30 percent if such popular passenger vehicles as vans, light trucks and utility vehicles (multipurpose vehicles) held or expanded their market and fleet shares during the period. It would also be higher to the extent that center front seat deaths and injuries, not counted in the NHTSA study, were reduced by the provision of front seat driver and passenger air bags.

December 4, 1991

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ESTIMATED BENEFITS OF AIR BAGS, 1990-1995

NHTSA has developed information regarding the portion of the on-road vehicle fleet that will be equipped with air bags and the safety benefits that will result for each year between now and 1995. The vehicles that will be equipped with air bags through the 1991 model year are known and an estimate of air bag sales can be developed for 1990 and 1991 based on 1989 sales for those models. For 1992-1995, estimates will have to be made based on statements made by manufacturers and assumptions regarding the pace of air bag installation in new models. GM, has announced that it will install driver and passenger air bags in all of its domestically produced vehicles by 1995. Ford has indicated that it will also install air bags in its entire fleet by the mid-1990s (but has not specified a specific year). Chrysler has already installed driver air bags in its entire domestic fleet. Honda has announced that it will install driver and passenger air bags in all Honda and Accura models by the 1994 model year. Air bags are already installed or announced in many models by Volvo, Audi, Toyota, Saab, Porche, Nissian, Mitsubishi, Mercedes-Benz, Jaguar, BMW and Alpha Romeo. Overall, it appears most of the new passenger car fleet will be equipped with driver and passenger-side air bags by 1995. We have estimated annual safety benefits based on the following assumptions:

1) 90 percent of model year 1995 passenger cars will have driver and passenger air bags. Half of the increase in sales of models with air bags (over 1991 levels) will occur in 1995.
2) Half of the remaining increase will occur model year 1994.
3) The remaining increase will be spread evenly between 1993 and 1992.

4) After 9/1/93, (the 1994 model year) all vehicles that have driver air bag systems will also have front seat passenger systems.

90 percent was chosen as the 1995 installation rate because manufacturers' announcements indicate that about 90 percent of all domestically produced vehicles will have air bags by the mid-nineties, and it is assumed that imports will follow suit to stay competitive. Although Ford has not specified the exact year they will be completely converted, it is assumed that they will convert by 1995 to stay competitive with GM, Chrysler, and Honda.

The assumptions regarding the pace of conversion are somewhat arbitrary, but are consistent with the expectation that installation rates will increase gradually, with most new models being converted during the 1994-1995 period. This expectation is dictated by company announcements and leadtime considerations for both driver and passenger systems.

The assumption that all MY 1994 and later air bag equipped vehicles will have both driver and passenger side systems is based on the fact that the exemption which allows manual belt installations at the outboard passenger position if an air bag is provided at the driver position will expire on 9/1/93. Although manufacturers could provide an automatic belt at the outboard passenger position, it is unlikely that they would do so in any significant production volumes because this would put them at a competitive disadvantage vis-a-vis most other manufacturers who have announced their intention to provide passenger side air bags.

Based on these assumptions, the portion of the in-use passenger car fleet that will be equipped with driver air bags will increase from 1.8 percent in 1990 to 18.3 percent in 1995. The portion that is equipped with passenger side air bags will increase from 0.2

percent in 1990 to 10.8 percent in 1995. The safety benefits that would result from air bags during these years are shown in the attached table (Table 1). During this time period, assuming that belt usage rates stay at current levels, air bags should save an estimated 2,400 lives and 29,000 moderate to critical injuries.

Note that the benefits shown in Table 1 do not include center seats. Center seating positions are exempted from the automatic restraint requirements of FMVSS 208 and it is not clear whether passenger-side air bags will provide benefits for these positions. However, the contribution of these positions is minimal, and would increase total benefits by no more than one percent.

TABLE 1

Estimated Safety Benefits from Air Bags
Assuming No Center Seat Benefits *
1990-1995

	DRIVER			PASSENGER			TOTAL	
	% Fleet w/ Air Bg	Fatals	AIS 2-5	% Fleet w/ Air Bg	Fatals	AIS 2-5	Fatals	AIS 2-5
1990	1.79	72	892	0.15	2	21	74	913
1991	4.02	161	1998	0.32	4	45	165	2043
1992	6.62	266	3295	0.94	13	133	279	3428
1993	9.64	387	4794	2.36	32	332	419	5126
1994	13.27	533	6602	5.47	74	769	607	7371
1995	18.25	732	9077	10.82	147	1520	879	10587
Total		2151	26659		272	2819	2423	29478

* Benefits reflect safety improvement compared to 1989 in-use fleet.

TABLE 2

Driver Air Bag Installations in the In-Use Fleet***

Survival	1	0.993	0.982	0.964	0.935	0.892	0.831	0.753	0.662	0.568
YEAR	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
1986	79000	78447	77578	76156	73865	70468	65649	59487	52298	44872
1987		132000	131076	129624	127248	123420	117744	109692	99396	87364
1988			206000	204558	202292	198584	192610	183252	171186	155118
1989				529000	524304	518496	508992	493680	470976	438768
1990					2627458	2609066	2580164	2532870	2456673	2343693
1991						3181679	3159407	3124409	3067139	2974870
1992							3910452	3883078	3840064	3769675
1993								4639224	4606758	4555718
1994									5696770	6054092
1995										9011860
Total A/B Cars*	39500	144447	311654	674338	2241438	5110873	8579792	12706580	17812866	24530120
Cars in Operation**	117268	119849	121519	122758	124968	127217	129507	131838	134211	136627
% Fleet w/ A/B	0.03	0.12	0.26	0.55	1.79	4.02	6.62	9.64	13.27	18.25

* Assumes an even sales distribution throughout the year. Therefore, only half of the current model years fleet is included the first year.

** In thousands. Based on data in MVMA Facts & Figures '90. Future years estimates based on historical trend.

*** Air bag sales projections are based on 1989 sales levels for specific nameplates. Total sales in 1989 were 10,073,178 units.

TABLE 3

Passenger Air Bag Installations in the In-Use Fleet***

Survival	* 1	0.993	0.982	0.964	0.935	0.892	0.831	0.753	0.662	0.568
YEAR	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
1986	0	0	0	0	0	0	0	0	0	0
1987		0	0	0	0	0	0	0	0	0
1988			4266	4236	4189	4112	3989	3805	3545	3212
1989				86982	86373	85416	83851	81328	77888	72282
1990					185896	184595	182550	179204	173813	165619
1991						272639	270731	267731	262824	254917
1992							1365042	1355486	1340471	1315900
1993								2457444	2440242	2413210
1994									6096778	6054092
1995										9811860
Total A/B Cars	0	0	2133	47727	183510	410443	1223641	3116277	7346868	14785364
Cars in Operation	117268	119849	121519	122758	124968	127217	129587	131838	134211	136627
% Fleet w/ A/B	0.00	0.00	0.00	0.04	0.15	0.32	0.94	2.36	5.47	10.82

* Assumes an even sales distribution throughout the year. Therefore, only half of the current model years fleet is included the first year.

** In thousands. Based on data in MVMA Facts & Figures '90. Future years estimates based on historical trend.

*** Air bag sales projections are based on 1989 sales levels for specific nameplates. Total sales in 1989 were 10,073,178 units.

When Safety Belts Aren't Safe

A History of Auto Seat Belt Protection

By Edward M. Ricci, Esq.
Benjamin Kelley

FOREWORD

"Buckle Up For Safety!"

Probably every American who drives or rides in a car has heard the call to "buckle up"—not once but over and over again. Laws in a majority of states require seat belt use. In addition, federal and state safety officials, consumer groups, physicians and companies that manufacture and sell cars, loudly and repeatedly urge drivers and passengers to wear their belts. Drivers and passengers are saying to each other: "Buckle up for safety."

Is anybody listening?

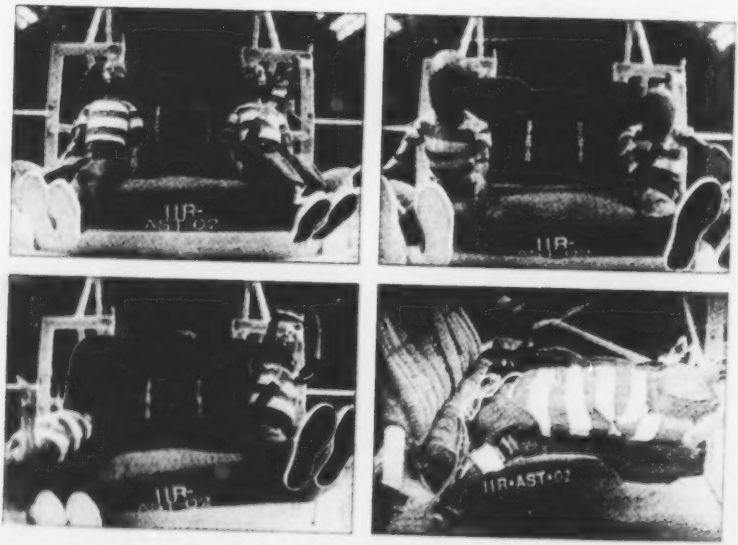
In fact, tens of millions of Americans are listening and they are heeding the call every day across the country. Belt use has soared in the past few years, from a low of about 10 percent to well above 50, 60 and even 70 percent in some areas. We have become a nation of belt wearers. We are, increasingly, buckling up.

But what are we buckling up with?

In the vast majority of cars on the highways today, we are buckling up with deficient, defective, damaging or deteriorating belts. Yet the car companies, which have conspicuously joined the "buckle up" chorus, have done little or nothing to remedy this national hazard. And our federal safety officials do not seem to care.

The bottom line is that motorists need to buckle up, but they need safe, hazard-free belts. As belt use soars, injuries caused or aggravated by belts soar with it.

It is tragic enough that car companies fail to build sufficient overall crashworthiness into their cars. But when they do not care enough even to provide optimum safety in seat belts, components that exist solely for safety purposes, it is a scandal. Today that scandal is exposing a large majority of Americans to horrendous injuries from the very system provided to protect them.



In these IIR impact tests comparing lap and lap-shoulder belt performance, dummies with lap-only belts experienced much higher forces on their lower torsos and heads than dummies with lap-shoulder belts. In real-world crashes, these differences translate into severe abdominal, spinal cord and head injuries leading to paraplegia, brain damage, colostomies or death. Lawsuits against car companies which have failed to provide rear lap-shoulder belts have hastened the availability of these improved restraints in new cars and, through retrofit kits, for older models.

INTRODUCTION

Car crashworthiness is a life and death concept. The widespread, decades-long failure of auto manufacturers to adhere to this concept has brought mortal injury or lifetime disability to millions upon millions of Americans. The flawed state of seat belt design and performance is one of the chief causes. Car crashes are entirely foreseeable and often unavoidable. But whether caused by bad weather, inexperienced driving, defective vehicle components, or any other condition, the crashes themselves do not in many cases need to produce deadly injuries. Frequently, when serious injuries do result, it is because the companies that manufactured the cars failed or refused to make those cars adequately crashworthy.

Safety belt performance plays a central role in the triad of crashworthiness: contain, maintain, restrain. The crashworthiness triad dictates that the car's design does the following in a crash:

Contain the occupants by providing doors, windows, sunroofs and other apertures that discourage ejection. If such designs cannot be provided and the manufacturer nevertheless insists on marketing the car, it is obliged to at least warn the prospective buyer and all potential users about the vehicle's ejection hazards and their injurious or fatal consequences.

Maintain the integrity of the vehicles so they will not collapse, crush, rip open or otherwise deform in ways that violate the all-important "protective envelope" provided by the occupant compartment. The size of the envelope must, of course, be adequate in the first place. "Maintain" also applies to the integrity of fuel tanks and lines; defectively designed, they can spew deadly gas and fumes that produce raging, deadly post-crash blazes.

Restrain the occupants by preventing or minimizing their violent movement within the vehicle or from it, preventing or minimizing their risk of hitting damaging structures in the vehicle and making all interior structures as "forgiving," i.e., energy managing, as possible in the event of impact. Historically seat belts have been the major component for accomplishing this crucially important piece of the crashworthiness triad.

The properly designed seat belt has been recognized by physicians and independent safety engineers as the most effective *active* means for restraining occupants in vehicles to minimize their violent movement within or from crashing vehicles. It is "active" because it requires the active, repeated cooperation of the user who must put the belt on each time he or she gets in the car. In contrast, "passive" or automatic systems such as air bags, energy absorbing steering columns, laminated windshields, padded dashboards and most other auto safety features in the car require no occupant activation. And, despite the protracted and fierce opposition of car companies to providing standard equipment seat belts during the 1950s and 1960s, they have existed for many years.

HISTORY

Visitors to the Wells Fargo Museum in San Francisco can see one of the earliest versions of a seat belt, a set of straps that stage coach passengers tied around their waists to prevent ejection during rocky cross-country journeys. On the East Coast, the Smithsonian Air and Space Museum exhibits World War I-era planes that are equipped with belts intended to "restrain" pilots and passengers from falling from their craft during barrel roll maneuvers. Even before World War II, pioneering physicians and vehicle design experts were beginning to identify a crying need for seat belt restraints in passenger cars. As car sales and traffic climbed, so did the death and injury toll from crashes.

Examining crashes and injuries, these medical and engineering experts soon saw patterns of trauma emerging that made it clear that by effectively restraining occupants from excessive or violent motion during the split-second moment of impact, serious injuries could be avoided or greatly minimized.

One of the earliest safety advocates, a Detroit plastic surgeon named Claire L. Straith, devised a seat belt system and installed it in his own car in the early 1930s. Despite the urgings of Straith, Dr. Fletcher Woodward, Hugh DeHaven, Dr. Horace Campbell, Dr. William Haddon, Col. John Stapp and others, most U.S. car companies declined to offer standard equipment seat belts until ordered to do so, first by individual state legislatures in the mid-1960s and, finally, by the federal government under the National Traffic and Motor Vehicle Safety Act of 1966.

Even then, the belt standards set under the Safety Act contained only minimum criteria that left broad design discretion to the manufacturers. For instance, the standards have failed to require any type of dynamic testing for seat belts in the vast majority of cars now on the highways. Meanwhile, at least one European company was forging ahead by providing seat belts in its cars, both in Europe and the United States, although not required by law. Volvo, the Swedish manufacturer whose new car marketing stressed safety and reliability rather than speed and cosmetics, proclaimed the value of seat belts during the 1950s on the basis of extensive car crash tests, laboratory work and field evaluation.[1]

By the late 1960s, as U.S. manufacturers were fighting federal proposals to require lap-shoulder instead of lap-only belts in the front seats of new cars, Volvo was able to show the vastly superior performance of the lap-shoulder design based on crash experience for the huge number of vehicles with belts that it sold in Sweden.

Volvo's work helped to underscore two critically important points:

Properly designed seat belts could make a major injury-reducing difference in crashes, and *poorly designed belts could result in decreased effectiveness and, in fact, could create, enhance or permit otherwise avoidable injuries.*

"A BELT IS A BELT"

Today, more than 20 years after the Federal Motor Vehicle Safety Standards (FMVSS) required safety belts in motor vehicles, many car companies and the National Highway Traffic Safety Administration (NHTSA) still have the public believe that "a belt is a belt," that every belt design, no matter how poor or hazardous, is as safe as any other. NHTSA's position is, "We can't tell people about this injury problem because if we did they wouldn't wear the lap belts."[2] It apparently had not occurred to the agency that its duty was not to delude people into wearing unsafe belts but to force recall and correction of the hazardous lap-only designs, for which the agency has ample authority.

The car companies steadfastly refuse to recall and correct the majority of their deficient belts. NHTSA has been acting to protect the companies rather than the motoring public. The burden of dealing with the bad-belt injury crisis has fallen on the tort system. People hurt by the car companies' failure to provide adequate belts in the first place find they must turn to the courts for redress because the companies and regulation have failed them.

As court case after court case reveals, belt systems and designs differ vastly and alarmingly in their performance when the chips are down—that is, when a crash occurs and the belt wearer suddenly, crucially, needs the belt's benefits. In that split second, the manufacturer's failure to have equipped the vehicle with an adequate belt system can become the difference between life and death for the belt wearer who has, after all, done his or her part by "buckling up."

BELTS - FOR BETTER OR WORSE

How should a properly designed seat belt perform? What protection should its wearer expect?

The answer is found in the nature of the car crash itself. In the car's impact with a fixed object or another vehicle, the so-called "first collision," the occupant continues to move after the car itself has decelerated. The movement will only be slowed or arrested when the occupant's body meets an opposing structure in the "second collision."

If that structure is hostile, e.g., a rigid metal roof rail, jagged windshield glass or the hard surface of a pavement outside the car, the results can be devastating. If the structure is protective, that is, if it spreads the crash forces across the occupant's body, diverts them from body areas especially vulnerable to life-threatening injuries and yields sufficiently to the body's impact, injuries can be prevented or substantially minimized.

The role of a properly designed seat belt system is to provide just that kind of protection in the "second collision" because, when worn, it is the first structure met by the violently moving occupant's body. As stated by the principal research scientist at General Motors (but routinely violated by that company in many of its belt designs):

"A snug fitting lap-shoulder belt ties the occupant directly to the passenger compartment and allows that occupant to 'ride down' the crash," thus eliminating "the more severe occupant-to-interior 'second collisions,' provided the belts are themselves fairly tight." And, "Belts are also designed to distribute restraining loads over strong skeletal structures, including the shoulder, rib cage, and pelvis, to optimize protection during deceleration."[1]

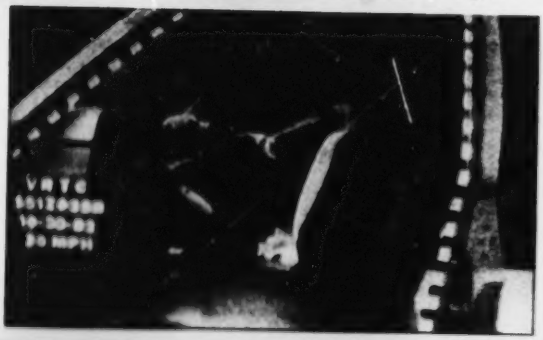
But a belt that is not properly designed, a former Ford engineer warned as early as 1970, "may itself contribute to injury in specific circumstances."[4] And a Society of Automotive Engineers (SAE) report cautioned as early as 1969 that a belt "should perform in a manner which applies restraint forces to appropriate areas of the anatomy and which results in minimal occupant injury, with consideration of skeletal, internal organ and soft-tissue damage, including disfigurement."[5]

How well have the warnings been heeded by car manufacturers? How closely are belts meeting even the basic criteria suggested by GM's own principal research scientist and the SAE? The answers are found in the real-world belt systems that Americans are being urged or required to "buckle up" in most cars on the highways today.

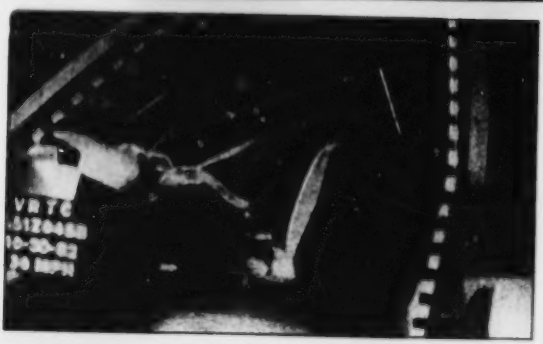
BEST COPY AVAILABLE

Snug Belt

Even a little slack can create serious hazards for occupants in crashes. So-called "windowshade" slack inducers can allow large amounts of slack to be introduced into shoulder belts, with or without the user's knowledge. In these tests, the National Highway Traffic Safety Administration found that even 2 inches of slack can nearly double injurious forces on the head in a crash and that with full slack, the forces will be 4½ times those with a snug belt. A jury found the "windowshade" design to be defective in Baird v. GM.



2 Inches Slack



Full Slack

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BELT BY BELT: A BRIEF OVERVIEW

Rear Lap Belts: In July 1986 the public was jolted by revelations that rear lap belts, the kind installed in almost every car sold in America prior to 1990, represented a deadly menace in very common crashes, especially to children. The news came in the form of a study, "Performance of Lap Belts in 26 Frontal Crashes," published by the National Transportation Safety Board (NTSB), the federal government's safety "watchdog."

However, the news came as no surprise to the auto manufacturers. For years they had been told repeatedly in medical and engineering literature that lap-only belts would not only permit needless injuries in some crashes, but also would cause injuries and that properly designed lap-shoulder belts would eliminate these hazards.

Updating those warnings, NTSB concluded: "Lap belts may induce injury, ranging in severity from minor to fatal, to the head; spine; abdomen; intra-abdominal viscera, connecting tissue, and blood vessels; and intra-thoracic viscera, connecting tissue, and blood vessels. Such injuries may occur singly or in combination."[6] As NTSB noted, the belts promote head injury by allowing the upper torso to swing forward, and abdominal and spinal cord injury by overloading the lower torso with crash forces.

Rear-belt use has increased since 1986; predictably and tragically, injuries have also climbed. Even NHTSA, which has failed to recall such belts or effectively promote the retrofitting of rear lap-shoulder belts, has admitted to Congress that as many as 6,000 deaths and injuries per year could be prevented by the replacement of lap-only rear belts with lap-shoulder belts.

One reason for the injury proliferation is that the lap belts often ride over the pelvis in crashes. By doing so, they violate a federal motor vehicle standard requiring the belt to "remain on the pelvis" in crashes.[7] This further increases the likelihood of severe abdominal and spinal cord trauma, especially to small children. Their delicate muscular and skeletal structures, coupled with the frequency of families putting the kids in the back seat, mean they are especially exposed to rear lap belt damage.

Slack Inducing "Tension Relievers:" An auto manufacturer can choose to install a properly fitting, comfortable, safe lap-shoulder belt for drivers and passengers or it can choose instead to provide an ill fitting, uncomfortable, dangerous belt and then attempt to offset the poor design with a so-called "tension reliever" that makes the belt more tolerable to wear but even more dangerous in a crash. Faced with federal standards requiring front seat outboard lap-shoulder belts in new cars starting in the early 1970s, most U.S. manufacturers took the second choice. Their lap-shoulder belts generally were so poorly designed that they squeezed the wearer's body uncomfortably, which discouraged use, and were routed across the necks and faces of shorter wearers that created or increased injury risks in crashes.

Rather than redesigning the belts to make them safe and comfortable, the companies instead equipped them with a "tension relieving" device known as a "windowshade." This is a device that allows the wearer to put up to several inches of slack in the belt by giving it a tug. The slack is supposed to solve the tight fit and dangerous routing problems, or at least cover them up. Instead it makes them much worse. A loose belt is a grave hazard in a crash. According to NHTSA tests, even an inch of slack can substantially raise head injury force levels, and a few inches can largely eliminate the belt's effectiveness.[8] Further, a slack belt can promote or allow ejection or severe submarining. The "windowshade" promotes slack both by encouraging the belt wearer to make the belt loose and by allowing slackness—sometimes many inches of it—to creep into the belt without the wearer's knowledge.

The best restraint system for front-seat occupants in a crash is the air bag combined with a three-point seat belt. But manufacturers have withheld that system from most cars. Instead, they have provided so-called "automatic" seat belts, many of which are hazardously designed. This "automatic" shoulder belt, tested by IIR in a rollover, gives no protection against ejection when the door opens in a crash because it is mounted to the door instead of the car's interior.

In June of 1979 a NHTSA contractor, completing an exhaustive analysis of belt design problems, warned that windowshades "should not be employed" because they "often allow excessive and dangerous slack in the shoulder belt..." NHTSA also indicated that removal of such devices would save not only lives but money, since the resulting cost of belts to car buyers would be less.[9] But manufacturers have ignored the warning.

In 1988 the NTSB repeated the warning and, referring to data, indicated that "increasing slack in a windowshade equipped lap-shoulder belt increases the chance of serious or fatal head injuries."[10] It urged curtailment of such devices. Although manufacturers appear to have begun phasing the devices out during the 1990 and 1991 model years, they refuse to deactivate them in cars already on the highways, thus leaving at risk hundreds of millions of American motorists.

Door-Mounted Belts: When a car door unintentionally opens, an occupant's need for a belt is especially urgent. Only a well-designed belt system will restrain the user from ejection through an open door. But if the belt opens with the door, it is as if the wearer never had a belt on in the first place! This is just what can happen with a commonly offered version of "automatic" seat belts, the ones that are supposed to buckle themselves up with no help from the user. Because the belts are anchored to the door, they pull open if the door opens in a crash, inviting ejection of the occupant, which is a leading cause of catastrophic injury in rollover and other crashes. In late 1990 a Maine police officer died from such an ejection. The door of his GM-made patrol car opened in a side impact with a telephone pole and the door-anchored "automatic" belt system became ineffective. To prevent additional tragedies, Maine has retrofitted manual belts into all its police cars.[11] Yet car companies continue to equip their new cars with door-mounted belt designs while doing nothing to correct the ones already on the highways or warn their owners about the ejection hazard.

Shoulder-Only Belts: For a long time a shoulder belt without a lap belt has been widely recognized as an extremely hazardous design. "In one study it was found that the upper torso belt [alone] can produce a more serious injury than the lap belt...this type of strap can cause severe injuries to internal organs or the neck [when the wearer slides out of the belt]. Even a lap strap alone was considered preferable..."[12] So wrote a leading biomechanics expert in 1970.

The hazards of shoulder-only belt systems have prompted manufacturers and governments in Europe and Australia to forbid the use of this design in any car. Yet as recently as 1990 such belts were being sold in the U.S. market and are still permitted under NHTSA safety standards.

The leading shoulder-only belt design is one developed by Volkswagen during the 1970s, when the German manufacturer was attempting to stop then-pending U.S. requirements for air bags in future new cars. VW claimed that its shoulder-only "automatic" belt would be an acceptable substitute for the air bag. However, the shoulder-only "automatic" belt compounds the hazards because it is mounted to the car door. It has turned out to be a nightmare for occupants who have suffered the injuries it so needlessly causes. The design is also found on recent model Hyundai and other vehicles; variations of it, popular with some U.S. and Japanese manufacturers, include an "automatic" shoulder belt and manual lap belt. Car-mounted, motorized "automatic" shoulder belts are also a hazard; when the door opens, it triggers the motor to remove the belt from the occupant.

Years ago NHTSA instituted a requirement still in effect today that all shoulder portions of separate lap-shoulder belt assemblies be labelled with a warning that "the shoulder belt is not to be used without a lap belt."[13] Somehow NHTSA and the car companies have conveniently ignored the urgent need for this warning to be prominently displayed on all so-called "automatic" shoulder-only belt systems. It is an omission that will continue to inexcusably endanger motorists in crashes until these systems disappear or are removed from highways.

Although the crash speed of this Ford Escort was only 18 mph, the rear-seat occupant was catastrophically injured by his seat belt. Violating a federal belt performance safety standard, the belt slid off his pelvis, resulting in devastating spinal cord and abdominal injuries and leaving him a life-long paraplegic. The front-seat occupants, who were completely unbelted, received no injuries at all.

ADDITIONAL PROBLEMS

Poorly Placed Anchorages: A number of car models popular in the United States are equipped with three-point lap-shoulder belts. The upper anchorage locations ensure a poor, dangerous fit for many users, including children and small adults.

A few car companies have attempted to correct these problems by providing newer models with adjustable shoulder belt anchorages. This permits the shoulder belt to be positioned in a more favorable and safe relationship to the upper torso, such as across the chest rather than across the neck, which ensures adequate protection in a crash. Yet despite the simplicity and low cost of adjustable anchorages, they are found on very few cars.

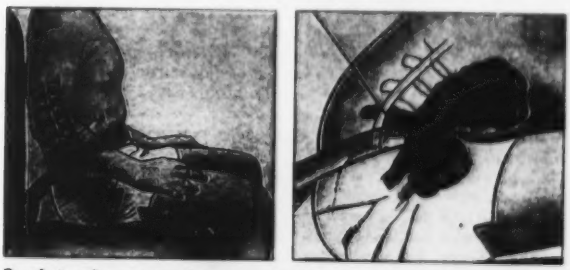
"Convenience" Hazards: In an effort to meet federal standards requiring belt accessibility, some manufacturers have ignored safety.

For example, to keep its rear lap-only belts from slipping behind the seat of many Escort models, Ford Motor Company attached the belt buckle to the seat by an elastic "strap retainer." Tragically, the "strap retainer" applied forces that pulled the belt off the wearer's pelvis, meaning that in a crash it becomes a lethal threat to abdominal organs and the spinal cord. In *Garrett v. Ford*, a U.S. District court jury in Baltimore found the Escort belt to be defective both because of the "strap retainer" and because, unlike European Escorts, it provided no shoulder belt in the rear seat.[4]

Excessive Playout: A belt that is loose is a belt that does not provide adequate protection. In normal use, the belt must be reasonably snug in a crash; it must remain tight across the chest and pelvis. Although some "give" in the belt webbing is necessary to attenuate the crash forces, too much slack will permit excessive forward motion of the wearer.

Belt systems can have too much slack for a number of reasons. These include designs that delay the lockup of the belt retractor mechanism. They also include unacceptably high amounts of spool-out, i.e., belt playout as the webbing tightens around the retractor. And of course, they include the "windowshade" slack-inducing designs described above.

A long-available but rarely used device for offsetting these deficiencies is the pre-tensioner. A pre-tensioner is a device for tightening the belt around the wearer when a crash is sensed. Impressive as this simple technology has proven to be in reducing crash injuries, it is available only on a few high-priced new cars.



Paraplegia and severe internal trauma are the all-too-common results of rear-seat lap-only belt injuries in car crashes. In Garrett v. Ford, a federal court found Ford Motor Co. responsible for such injuries inflicted on a 12-year-old Maryland boy. The federal government has estimated that as many as 6,000 deaths and injuries could be avoided in crashes each year if the rear seat belts of all cars were equipped with lap-shoulder belts instead of lap-only belts.

Jimmy Garrett

CONCLUSION

Federal safety regulations have failed to keep unsafe seat belt systems off the market. As a result, the vast majority of cars driven by Americans today are equipped with the kinds of inadequate, hazardous belts discussed in this paper. Current federal regulatory policy effectively shields the manufacturers of these defective seat belt systems from tougher standards and recalls of defective belts. The federal government is not living up to its statutory mandate to adopt effective belt standards for new vehicles and recall unsafe belts in older vehicles.

The original intent of the FMVSS for seat belts has been perverted. It is both tragic and perversely ironic that, as belt use increases, needless and fatal injuries from bad belts are increasing proportionately. When belt usage in the United States was minimal, defects inherent in restraint systems were not apparent. Now, seat belt usage laws and "buckle up" campaigns have exposed a frightening potential for injury and death from these unsafe "safety" belts.

Because of the anticonsumer attitude of both federal regulators and the auto industry in general, automobile occupants injured or killed as a result of unsafe seat belts have little recourse other than the tort system. In pursuing their rightful claims for safe seat belts they will continue to bring pressure on errant auto manufacturers and, hopefully, NHTSA to honor their responsibilities to provide restraint systems that are safe and to replace those that are not.

"Buckle up" is a goal we can all applaud. However, it will continue to be a bittersweet and pain-tinged refrain as long as unsafe belts are used on America's highways.

Edward M. Ricci, recognized as one of the nation's leading trial attorneys, has written extensively and lectured before many professional trial organizations across the United States. His wide range of expertise includes product liability, highway design litigation, auto negligence, insurance company unfair claims practices and "bad faith" dealings with policyholders. He is principal of the law firm of Edward Ricci & Associates, P.A., West Palm Beach, Florida, and is a founding member of the Institute for Injury Reduction.

Benjamin Kelley is president of the Institute for Injury Reduction. A nationally recognized authority on motor vehicle safety performance, injury reduction and public education, Mr. Kelley has spent nearly 25 years as a researcher, lecturer, writer and administrator in major product-injury programs. He has held senior positions with the U.S. Department of Transportation and the Insurance Institute for Highway Safety. He is also president of A.B. Kelley Corp., a firm providing consulting services in product injury areas.

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Chairwoman SCHROEDER. Thank you. Mr. O'Neill.

STATEMENT OF BRIAN O'NEILL, PRESIDENT, INSURANCE INSTITUTE FOR HIGHWAY SAFETY, ARLINGTON, VA

Mr. O'NEILL. Thank you Mrs. Schroeder.

I will summarize my statement and ask that the complete statement be placed in the record.

I am President of the Insurance Institute for Highway Safety, a nonprofit research and communications organization supported by the nation's casualty insurers.

At the subcommittee's request, I am submitting comments on the history of manual and nonmanual automatic restraints and the safeguards in place for underriding big trucks.

Crashes are the number one cause of death for people under 35 years old. They cause 20 percent of all deaths of 5 to 29 year olds—40 percent of all deaths of people in their late teens. And deaths aren't the only problem—motor vehicles are associated with more than 500,000 hospital admissions annually. Crashes are the leading cause of head injuries, brain injuries, and spinal cord injuries.

Now that millions of cars are being equipped with air bags there is no longer any debate, everyone agrees that the combination of a good lap/shoulder belt plus an air bag is the best way to protect people. The road to acceptance of not only air bags but also safety belts is a long and rocky one. It took longer to get manual shoulder belts in all cars than it did air bags.

As early as 1903 there was a patent on a restraint system consisting of adjustable lab belts for cars. In the 1940s physicians were urging car companies to install seat belts as standard equipment. It was not until 1955 that Ford and Chrysler made seatbelts options in 1956 models. It was not until the late 1950s and early 1960s that some state laws required lap belts to be installed in new cars. It was not until 1973 that three point lap/shoulder belts with inertial reels were required by federal standard. Air bags also took a long time.

In 1952 there was the first air bag patent. In 1970 the Department of Transportation ordered automatic restraints to be installed by the 1974 model year. The standard was on again and off again and it was not until the 1987 model year that the restraints were installed under a Federal requirement.

Today all new cars are required to have automatic restraints in the front seats, either air bags or automatic seatbelts. Automatic belts have two basic varieties, automatic shoulder belts accompanied by a manual lap belt and you saw some of these in the video. Such systems do produce higher use rates than manual lap/shoulder belts.

As you heard earlier, there is the problem that many people fail to buckle up the lap belt and consequently they are not as well protected. They are not as well protected as they would be with a buckled lap/shoulder belt and an air bag.

Another kind is the three point automatic seatbelt used in General Motors and Honda cars. This is so difficult to use automatically and so easy to disconnect, it is a joke to consider it an automatic seat belt.

We are fortunate I think that we are finally reaching the point where all manufacturers have recognized the value of air bags, plus manual lap/shoulder belts. Automatic seat belts will be disappearing from new cars. We have still the problems of many cars equipped with them. We will see the automatic seat belts going the way of the dinosaur. They will become extinct and not too soon.

You have heard from Mr. Bloch about the problem of truck underrides. About 400 deaths occur each year because of collisions into the back of trucks. Although less than 100 of these deaths involve underride, this is an area of highway safety in which U.S. standards lag behind those of Europe where effective underride guards are required on the backs of trucks.

The agency may say the underrides are not a big problem because of the small number of deaths that occur each year but it is an issue where we should have effective standard.

The government does have a requirement and it has been in effect since the 1950s, and this requirement is worse than none. It says to provide protection against underride, when as you saw in the video, these devices are totally ineffective. Effective underride guards can be put on the backs of trucks to prevent deaths. We should replace the present ineffective standard with one that would be effective. We should have reflectors.

We should have better conspicuity of vehicles and reflectors on the sides as well as the rear. We should have effective underride guards.

I would just like to say one thing in relation to the effects of safety standards on competitiveness. That is a question you raised earlier. There is a strong case to be made that effective Federal regulation enhances U.S. competitiveness.

Let me give you two examples: In the late 1970s there was a Federal requirement that all large trucks be equipped with antilock brakes. That standard went into effect. It was a controversial standard but there is absolutely no question that as a result of that standard in the late 1970s, U.S. industry led the world in antilock brake technology. The rest of the world was licensing that technology. This U.S. technology was spurred by aggressive Federal regulations.

The standard was overturned in a court challenge by the trucking industry and the manufacturers, and because there was no longer any demand for these brakes on big trucks, U.S. manufacturers abandoned the technology. The Europeans picked it up. They have adopted antilock brake requirements for big trucks and now we buy the technology back from them. We are in effect buying our own technology which was exported to Europe, than improved in Europe, and we now use the European technology which was technology that originated here.

Another example where U.S. competitiveness is enhanced is air bags. Air bags are a big success story. It is also important to understand that the bulk of the air bag supply industry is U.S. The Japanese manufacturers are buying U.S. technology when it comes to air bags. There are some European suppliers, but most of the sup-

pliers and most of the technology is U.S. I think a strong case can be made that by leading the world in safety regulations we can enhance and not impede U.S. competitiveness.

[Prepared statement of Brian O'Neill follows:]

Prepared Statement of Brian O'Neill, Insurance Institute for Highway Safety, Arlington, VA

The Insurance Institute for Highway Safety is a nonprofit research and communications organization, supported by the nation's property and casualty insurers, that identifies ways to reduce motor vehicle crashes and crash losses. I'm the Institute's president and, at this committee's request, I'm submitting comments on the history of manual and automatic restraints and the absence of adequate safeguards against passenger vehicles underriding big truck rigs.

Motor vehicle crashes have a profound effect on American children, youth, and families. Crashes are, in fact, the number one cause of death in the United States for people ages 1 to 35 years old. They cause 20 percent of all deaths of 5-29 year olds -- 40 percent of all deaths of people in their late teens. And deaths aren't the only problem -- motor vehicles are associated with more than 500,000 hospital admissions annually. Crashes are the leading cause of head injuries, brain injuries, and spinal cord injuries.

By far the largest category of motor vehicle deaths involves passenger vehicle occupants. More than 32,000 people died as occupants of passenger vehicles (cars including the popular passenger vans that are often referred to as minivans, larger vans, pickup trucks, and utility vehicles) in 1990. It is this group of people -- passenger vehicle occupants -- that automatic restraints and truck underride guards are designed to protect.

Manual Lap/Shoulder Belts

Now that millions of new cars are being equipped with air bags, we can safely say that the long debate about whether they really save lives is over. Air bags do save lives -- we've known for decades they would -- and the combination of an air bag and a lap/shoulder safety belt is the best available crash protection. But the road to acceptance of not only air bags but also safety belts has been a long and rocky one. In fact, it might surprise this committee to know that it took longer to get manual lap/shoulder belts installed in all cars than it did to get air bags to their present status as the automatic restraint system of choice.

As early as 1903, a Mr. Leveau of France devised a restraint system consisting of adjustable cross and leg straps. It then took 70 more years to get belts installed in all new cars sold in the United States.

1920s:	Lap belts begin to be used in race cars
1930s:	Earliest call for factory-installed seat belts comes from two physicians, Claire Straith and C.J. Strickland
1954:	Sports Car Club of America makes lap belt use mandatory for competing drivers
1954:	Automobile Manufacturers Association's Vehicle Safety Committee says that "until it is factually known" whether belts provide "increased protection for the wearer or cause increased bodily injury, it would be unethical for the engineers or the vehicle safety committee to recommend their use"
1955:	Ford and Chrysler announce that seat belts will be options in 1956 models; American Motors and, later, General Motors, follow suit
1959-61:	Seven states enact laws requiring seat belts in new cars
1964:	Most U.S. automakers begin installing front-seat lap belts as standard equipment
1966:	Sports Car Club of America mandates shoulder belt use for competing drivers
1966:	Transportation Department proposes equipping cars with shoulder belts, beginning with 1968 models; General Motors responds by saying it knows "of no reliable statistical data on shoulder belts .... persuades us to recommend against mandatory installation of shoulder belt designs"
1968:	Federal standard requires lap and shoulder belts in front-seat positions of all new cars except convertibles
1973:	Three-point lap/shoulder belts with inertia reels are required by federal standard

As this brief chronology indicates, it took a very long time to get lap/shoulder belts in all new cars. And still, people weren't necessarily protected in crashes because requiring manufacturers to install the belts didn't mean motorists would use them. Voluntary belt use rates have always been low and, despite numerous promotional campaigns conducted over many years and at considerable cost, little has been found that works to cajole motorists to buckle up voluntarily.

It was specifically to increase use rates that safety belt laws began to be enacted, beginning in Australia in 1970. Such laws garnered little political support in the United States, however, and didn't even begin to be enacted in this country until the mid 1980s. Now most U.S. states have belt use laws, but many of them don't provide for strong enforcement and are, consequently, not producing use rates much beyond 50 percent.

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Automatic Restraints

Automatic restraints -- first called "passive" restraints -- were conceived as a means of protecting motorists in a range of crash types without the need for occupants to buckle up.

Air Bags. The first automatic restraint was the air bag, which was designed to inflate automatically and protect occupants' heads and faces in front- and front-angle crashes. It was known from the beginning that air bags would be used in addition to belts, so they wouldn't provide a wholly automatic system of crash protection. Still, air bags would save lives in the deadliest kind of crash -- the frontal crash.

The history of air bags is not unlike that of lap/shoulder belts in that both are fraught with delay. Finally, millions of new 1992 model cars are being equipped with driver-side air bags -- most will have passenger-side air bags in upcoming model years -- but the road has been long and bumpy:

- 1952: First air bag patent is filed
- 1970: Transportation Department orders automatic restraints by 1974 model year
- 1972: Automatic protection rule is amended to allow ignition interlock as an alternative
- 1973: General Motors pledges to build 1,000,000 air bag-equipped cars in 1974 model year; actual production is limited to 10,000 cars in 1974 and '75 model years
- 1974: Congress outlaws interlock
- 1977: Transportation Department substitutes demonstration program for automatic restraint requirement; Ford, General Motors, and Mercedes-Benz agree to manufacture cars with air bags in 1980 model year; later in 1977, automatic restraint standard is reinstated with 3-year phase-in starting in 1981
- 1981: Automatic restraint standard is canceled -- again
- 1983: Finding cancellation "arbitrary and capricious," U.S. Supreme Court sends matter back to Transportation Department
- 1984: Automatic restraint standard is reinstated with phase-in of automatic belts or air bags to begin with 1987 model year
- 1991: Automatic restraint requirement is extended from passenger cars to light trucks and vans beginning with 1995 models

The theme of this abbreviated chronology is that air bags, like safety belts before them, weren't greeted with universal enthusiasm. The effectiveness of both had been demonstrated in laboratory tests and on-the-road use. But adoption was delayed by political considerations. This is the way with most motor vehicle safety innovations. That is, it's usually political controversy -- not technical problems -- that delays them for years, causing needless loss of life until safety wins out, often later rather than sooner.

Automatic Safety Belts. Conceived by automakers as a means of avoiding air bags, automatic belts are of two basic varieties -- automatic shoulder belts accompanied by either a manual lap belt or no lap belt at all. Such systems do produce higher use rates than manual lap/shoulder belts and, since first installed in 1975 Volkswagens, some types of automatic belts have been associated with reductions in motor vehicle occupant deaths and injuries.

The first automatic belts were installed as options in Volkswagen Rabbits, beginning with 1975 models. VW's system was designed to automatically position a shoulder belt around drivers and front-seat passengers. In place of a lap belt, a knee bolster was included to restrain the lower body in a crash. These restraints were found to be effective -- the frequency of insurance claims for occupant injuries in frontal crashes involving Rabbits with automatic belts was 17 percent lower than for comparable Rabbits with manual belts. The frequency of head injury was 43 percent lower. These findings are important because frontal crashes in general and head injuries in particular cause the majority of motor vehicle occupant deaths.

The next cars to be equipped with automatic belts were Toyota Cressidas. The shoulder belt design for this car was the first motorized one -- that is, the first designed to move along a guide rail in the car roof and position itself around an occupant when the door is closed and the ignition turned on. Use rates of 90 percent were observed after such belts were installed -- far higher than the 20 percent or so rate that prevailed with manual belts. And insurance claims for injuries were lower for Cressidas than for Nissan Maximas, similar cars equipped with manual belts.

Despite the benefits associated with the first as well as later generations of automatic belts, there are problems with these systems. One is that many automatic belts provide only an auto-matic shoulder portion, so motorists have to remember to buckle their manual lap belts. Another problem is that many automatic belts are inconvenient to use and easy to disconnect -- so easy

to detach and use manually, in fact, that the automatic benefit is lost. Recent studies have shown no difference at all in use rates between General Motors and Honda cars equipped with manual belts and the kind of automatic belt that's so inconvenient to use and easy to disconnect.

It would be essential to ensure that all automatic belts were of the easy-to-use and hard-to-detach variety -- except for one important fact, which is that automatic belts are becoming obsolete. About 90 percent of all 1987 model cars with automatic restraints had automatic belts. This proportion is down to about half -- and declining every year.* By the 1996 model year, virtually all new passenger vehicles and light trucks are expected to be equipped with air bags for front-seat passengers as well as drivers. Then the question of which automatic belt is best will be moot.

Truck Underride

About 400 deaths of passenger car and pickup truck occupants occur each year because of collisions into the back of big truck rigs. At least 100 of these deaths involve underride -- a situation that occurs when a passenger vehicle collides into the rear end of a tractor-trailer rig and, because the rear of the truck is so much higher off the ground, the passenger vehicle slides under the trailer. The trailer may then intrude into the compartment of the passenger vehicle, and death or serious injury -- even decapitation -- may be the result for the people inside.

Underride is an area of highway safety in which U.S. standards lag far behind those in effect in Europe, where effective underride guards are required on the backs of trucks. In 1986, researchers working with the Institute studied the effectiveness of the tougher underride guards required in Europe. Ten relevant crashes were studied in depth, with clear evidence of the superiority of the kind of guards already required in Europe but not in the United States.

A Federal Highway Administration standard, in effect since the 1950s, purports to address the underride issue in this country. But it is, in a sense, worse than no standard at all because it leads to the misapprehension that trucks actually do provide rear-end protection. In fact, they do not because the underride standard contains no crash protection performance specifications what-

* A consumer publication, "Shopping for a Safer Car" (attached), identifies new car models with air bags and other valuable safety features. It's free for the asking from the Insurance Institute for Highway Safety.

soever. As a result, many so-called underride guards are so inappropriately designed or flimsy that they crumple under the force of even low- or moderate-speed impacts. Effective underride guards do exist -- remember that they're required in Europe but not in the United States.

Another problem with the underride standard is its specification that "clearance between the effective bottom of [truck] bumpers or devices and the ground shall not exceed 30 inches with the vehicle empty." This amount of clearance -- 2-1/2 feet -- is plenty to permit many common sizes and shapes of automobiles, particularly smaller ones, to underride trucks and end up with their passenger compartments and the people inside mangled. This is true even when people are properly restrained by safety belts and/or air bags.

It's because of such shortcomings in the underride standard that the Insurance Institute for Highway Safety petitioned the U.S. Department of Transportation in 1977 to establish performance requirements for truck rear-end underride guards. Since then, the Department has moved in fits and starts, always acknowledging the problem of underride but failing to follow through with a tough performance standard: in 1981, a notice of proposed rulemaking was issued to require lower, sturdier rear truck guards, starting with 1984 models; in 1983, a final decision was promised by spring; in 1984, analysis of various underride guard designs was completed but, seven years later, no standard has been issued. The latest word is that the Transportation Department in 1991 "is considering proposing equipment and vehicle standards for regulating the installation of suitable rear underride guards for various types of newly manufactured trailers" -- the same thing the Department has been saying for, literally, decades.

Conclusion

What I've covered in this statement is one case of success at long last when it comes to air bags in passenger vehicles and another case in which years of attention have been paid to a serious problem -- truck underride -- without resolution. There's been no government action, so lives continue to be lost in underride crashes. Families continue to be disrupted. Society pays. It's time for action -- not because so many deaths are involved in underride crashes but because the solution is so simple.

Chairwoman SCHROEDER. I thank you both very much. I appreciate your patience in waiting.

Mr. Kelley, I want to go through what you said about disconnecting. There is the automatic belt and the slack mechanism. You are talking about the slack mechanism, correct?

Mr. KELLEY. I am. I am not in any way in this proposal referring to anything but the windowshade slack mechanism which is found on three point lap/shoulder belts placed on domestic cars up until last year.

Chairwoman SCHROEDER. So that mechanism is the thing that cuts in after you have closed the door?

Mr. KELLEY [Demonstrating]. When I have closed the door on this button, the retractor, here, is down in the base of the car's B-Pillar. If my colleague will keep the door closed for me, I will then extend the belt and show how much slack can be put in it. That is all looseness in the belt across the upper torso, put there as you saw in the film by simply riding in the car. That slack stays until you give it a good yank and then it is released.

When the door is opened the slack is taken out of the belt so it won't be caught in the door. This has nothing to do with the belt following you when you move forward. All this slack is caused by this little lever here. This little lever which is attached by a tiny spring can be removed. The little spring can be removed or the button can be removed. Any one of those steps which a backyard mechanic can do in 2 or 3 minutes, stops the slack mechanism.

Chairwoman SCHROEDER. But if you do that, you would not be lashed to your seat?

Mr. KELLEY. That is correct. The car companies have implied that would be the result. You can still move back and forward. The belt is in no way impaired.

Chairwoman SCHROEDER. You are now moving the belt without the slack mechanism?

Mr. KELLEY. That is correct. The slack only happens if the button is pushed in.

Chairwoman SCHROEDER. You sort of lock it in?

Mr. KELLEY. That is right. Sometimes it works. Sometimes it doesn't.

Chairwoman SCHROEDER. You are not coming out against the shoulder harness. You are not coming out being lashed to the seat which could be harmful?

Mr. KELLEY. Not at all. The inertial belt reel which follows you when you move is inside the retractor. The windowshade device, which the car companies added to the car, increased the car cost by $25. (NHTSA said in a report that it costs the companies $2.50). It can be disconnected with no trouble.

Chairwoman SCHROEDER. What happens if you take this into your car dealer because you are a klutz like Pat Schroeder and you say I saw this in a hearing and I want this taken off.

Mr. KELLEY. Don't do it yourself. If something else goes wrong with the belt, the car companies will blame you. But if you go to the dealer and ask that it be disconnected, the dealer's response will be, I am not allowed and I am not going to touch that system because it is covered by Federal safety regulations.

We have written to every manufacturer and to NHTSA asking them to make this disconnect available. They have completely refused.

Chairwoman SCHROEDER. Is there a Federal regulation?

Mr. KELLEY. No, there is no Federal regulation whatsoever governing the presence of this windowshade.

Chairwoman SCHROEDER. Do you think their mindset might change when you see recalls like today?

Mr. KELLEY. My wish has been for some time that the car companies simply recall this and do it on their own, that they do it without every consumer having to go to the dealership and asking that it be done. I don't see any chance of that happening given NHTSA's attitude. Every one of these should be disconnected.

Chairwoman SCHROEDER. Does anyone know why the car companies have stopped using these as of late? I don't think they are using the windowshade belts, are they?

Mr. KELLEY. That is correct. When NHTSA was petitioned to set a standard on this, one of their reasons for denying it was that car companies were going to take them out anyway. I found that interesting. If windowshades are fine but the car companies are going to take them out, there is a certain contradiction in now not investigating why.

They are not now being included in new cars. Yet new-car manual belts are being worn and are doing very well in cars without windowshades. There is no reason whatsoever they could not be disconnected in the past cars.

I believe the car companies are taking them out because they are being sued by an increasing number of people who have been injured or whose loved ones were killed because of the belt slack.

Chairwoman SCHROEDER. I understand, Mr. O'Neill, your agency did a survey of car dealers about what families want in a car?

Mr. O'NEILL. Yes. We asked car dealers in the area a number of questions relating to what the perceptions of the dealers were and the items that were most important to new car purchasers today.

The item that received the highest response was quality. In other words, the dealers believed that the new car purchaser was overwhelmingly interested in the quality of the product. Number two was safety, it ranked higher than price, performance, styling.

Chairwoman SCHROEDER. Why don't the dealers convey that to the car manufacturers?

Mr. O'NEILL. I think they are today. I hear from manufacturers that they are getting tremendous pressure from their dealers on air bags. You heard about the Saturn. A very bad decision was made by General Motors a few years ago not to design an air bag into that car.

I understand there is an accelerated air bag design for the Saturn. Saturn dealers say they have too many people asking for air bags. I think the message is coming back today. This is a new message from the dealers.

Mr. KELLEY. We have recently heard interesting reports that underscore how popular the air bag is. We have heard from people who purchased cars without air bags after being told by the salesman that the car had an air bag.

It is difficult to see if there is an air bag in that steering wheel or not.

Chairwoman SCHROEDER. They are terribly popular. I know all sorts of people where that is the only thing they are looking for. They don't care if it has tires.

What was NHTSA's response to the truck underride information we saw in the film before?

Mr. O'NEILL. There have been proposals languishing since the early 1980s. In fact, the agency has just allowed that pending rule making to in effect sit on a shelf. There are now rumors that some sort of a rule will be proposed before the end of the year.

We have periodically put research information into the docket to keep the issue alive but there has been virtually no interest on the part of the agency on truck underride rule making since the early 1980s, despite the fact that we have among other things put into the docket evidence of the effectiveness of the European requirements.

This is not major or complicated rule making. We are not talking about sophisticated devices. This is just simply saying if we are going to have underride devices, let's have some performance, strengths and height requirements that make sense with reference to the problem that is supposed to be addressed.

Chairwoman SCHROEDER. And we are waiting.

You saw also the videos on crashes and the slack inducing belt. Is that an accurate portrayal on what is going on?

Mr. O'NEILL. There is no question that slack in a seat belt greatly compromises the ability to restrain people in crashes. We did studies to find out how often slack was out there in the traffic stream. In domestic cars that permit slack in the belt, many motorists had excessive slack in the belts.

By contrast in Europe cars where there have been no such things as windowshades and other devices, you saw no slack, yet people still buckle up. It is not a question of people will only buckle up if they have the so-called comfort and convenience features in their belt systems because clearly people are buckling up in imports which don't have these features.

Mr. KELLEY. The imports had a higher rate of use even though the domestics provided these windowshade slack features. I have looked at many cases where the slack was the cause of injury and many were low-speed crashes where a properly buckled person would have no injuries.

The injuries were devastating, including quadriplegiac because they were permitted as the body moves forward over the lap belt. It was as if you had no shoulder belt at all.

Chairwoman SCHROEDER. I guess one of my real frustrations is I thought we would have good news, since Congress passed the highway bill. I had hoped NHTSA would tell us they were moving forward. I think some American manufacturers are moving ahead. They are not using sex to sell cars. They have been talking safety.

So I am saddened to hear that it may be a front, and maybe not what is going on behind the scenes. I hope what is going behind is that the dealers are telling them that safety sells.

I am sure if we hear from them they will say Mr. Kelley and Mr. O'Neill are representing lawyers and insurers and we know law-

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yers and insurers because they are the people you bury 26 feet down because deep down they are really good people.

How do you respond to that? You have had two groups here that they love to taint, too. One of the things I heard in this debate is we cannot make this debate nonpartisan or figure out what we should do economically and competitively about safety, they tend to attack the messengers, that anybody who attacks American autos are flakes.

I am sure they will say your money came from lawyers or insurance companies. So they may say we may be bad, but those guys are worse.

Mr. KELLEY. I am double tainted because for 16 years I was with the Insurance Institute on Safety. The only answer I can give you is this one: The people who support my present organization number fewer than 200 attorneys. These particular attorneys don't like to see the broken bodies. They have seen a lot of them. They know there are unsafe products and want them taken off the market.

When I was with the Insurance Institute for Highway Safety, the insurance people I knew were similarly committed, and I think Mr. O'Neill will tell you that is what is happening today. Today we are seeing safety advertised by car companies as you observed, Madame Chairwoman. That is exciting, but underscores a tragically missed opportunity by the NHTSA.

NHTSA should be saying, we will mandate what you want, mandate what we see in these commercials—air bags, better safety, more crashworthiness, safe belts.

This is an unparalleled opportunity to move on a wave of public support and NHTSA is totally ignoring that public support. We need to mandate these and not have them for the rich folks. We don't have pasteurized milk just for those who can afford it.

Chairwoman SCHROEDER. Why aren't we the pit bull for the American people? Why don't we say car A is the safest car you can buy, and put all the cars in the showrooms and see who buys them? They wouldn't all have to have the same things. Then they couldn't say "gee, we can put that in because it costs us more money." Lets see if the Sweedish Bikini team can sell it without it.

We don't see them being a bridge or trying to build this consensus or give the seal that people rely on rather than duck behind the Dan Quayle competitive council shield, which I think people are tired of.

Mr. O'NEILL. Let me add my response as well. The insurance industry is unique in one respect because when it comes to highway safety and reducing deaths, injuries and losses on the highway, the interests of insurers coincide with the interest of the general public. That is the motivation for insurers to support efforts like the institutes, which are aimed at reducing the losses. In terms of safety, their objectives coincide with those of the general public.

A few things about the car companies and NHTSA. A number of issues talked about today reflect history. The windowshade device is gone at least from new cars. Automatic seat belts are disappearing as fast as manufacturers can get suppliers to provide air bags. We are hearing about new improved side impact protection, and there is competition to claim the safest product out there.

I agree with Mr. Kelley this provides wonderful opportunities for the Federal agency to play an aggressive role in making sure that we don't finish up with only Volvos with protective features, but that all car manufacturers pick up the technology that is out there.

This is an exciting time. We need to promote competition among car manufacturers. I think ranking and rating cars by name has a role in this. But I must say in contrast to the car companies, which do understand that safety sells, we have a problem with the trucking industry. The attitude of the trucking industry to regulation is that we have to fix all the bad drivers and shippers; don't make us do anything to our trucks. Big trucks are involved in 5,000 fatalities a year.

We need antilock brakes, on-board recording devices, and other safety improvements on trucks, but we don't do this because the truck industry attitudes are like the car industry attitudes of the 1960's—it is not the vehicle, it is the nut behind the wheel.

It is time we got the trucking industry to come into the 20th century and understand that things need to be done to their equipment to make it safer on our highways.

Chairwoman SCHROEDER. Just as there are some good lawyers and some good insurers and some good Congresspeople, let's hope there are some good trucking companies and auto firms, and we do need to make progress on it. As I recall my physics, the greater mass wins, and the greatest mass on the highway is the truck. So that becomes a great concern as to what you do in any kind of a accident.

It is interesting how automotive companies were willing to use that greater mass in the commercials. As we were talking about fuel efficiency, suddenly the Congress was finding that you drive a little blow-up car that was going to be crushed by a pickup. If we wanted fuel economy we would have to drive small dangerous cars. We have a lot of work to do and let's hope the highway bill is the kickoff. The more we can encourage that kind of competition, the better off we will be.

I thank you both for being here and I appreciate your contribution to the whole oversight.

Our last witness was supposed to be our Federal rulemaking authority funded by all the happy taxpayers, the National Highway Traffic Safety Administration in Washington, D.C. I don't think they are here, and I guess they kept their word—they did not come. I find that very sad. I guess that shows that Sununu is not the only one with an overgrown ego in the city.

People get mad because they fund agencies that are supposed to defend them, and we were hoping they could come and shed light and it would be a new day. Maybe we will have to subpoena them. It saddens me that they feel that they can thumb their nose at the Congress and not appear and not answer many of the very serious questions that I think we had today.

With that, since we don't have our last witness, we will adjourn the hearing. We will be more than happy to hold the record open for anyone who has things they would like to add.

Thank you very much, and the hearing is adjourned.
[Whereupon, at 12 noon, the select committee was adjourned.]
[Material submitted for inclusion in the record follows:]

U.S. House of Representatives
SELECT COMMITTEE ON
CHILDREN, YOUTH, AND FAMILIES
385 HOUSE OFFICE BUILDING ANNEX 2
WASHINGTON, DC 20515-6401

December 18, 1991

Ms. Joan Claybrook, President
Public Citizen
2000 P Street, N.W., Suite 610
Washington, DC 20036

Dear Ms. Claybrook:

I want to express my personal appreciation to you for appearing before the Select Committee on Children, Youth, and Families at our hearing, "Automotive Safety: Is Enough Being Done to Protect America's Families?" held here in Washington on December 4, 1991. Your testimony was important to the work of the Committee.

The Committee is now in the process of preparing the transcript for printing. It would be helpful if you would go over the enclosed copy of your remarks to assure that they are accurate, and return the transcript by Monday, December 30, with any necessary corrections.

In addition, Representative Clyde C. Holloway, a member of the committee, has requested that you answer the following questions for inclusion in the printed record:

1) The written statement of a witness who has testified, Mr. Benjamin Kelley, notes that he produced a film on truck underride for the Insurance Institute in 1973. You, Ms. Claybrook, were a NHTSA administrator for four years, from 1977 to 1981. If this problem was so serious and well-documented, why did you wait so long to address it?

2) As an NHTSA administrator you pushed the auto industry to improve the comfort and convenience of safety belts, did you

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not? Didn't automakers develop tension relievers or so-called windowshades in response to concerns about the comfort and convenience of safety belts?

Sincerely,

PATRICIA SCHROEDER
Chairwoman
Select Committee on Children,
Youth and Families

Enclosure

RESPONSE FROM JOAN CLAYBROOK TO QUESTIONS POSED BY CONGRESSMAN CLYDE C. HOLLOWAY

1. The written statement of a witness who has testified, Mr. Benjamin Kelley, notes that he produced a film on truck underride for the Insurance Institute for Highway Safety in 1973. You, Ms. Claybrook, were a NHTSA administrator for four years, from 1977 to 1981. If this problem was so serious and well documented, why did you wait so long to address it?

Response: As NHTSA Administrator, I did address the problem of truck underride. The agency under my direction conducted research and testing and issued a proposed safety standard. However, after I left, little work continued and no final standard has ever been issued. As the hearings were being initiated in late 1991 by Mrs. Schroeder to investigate the agency's inaction, the NHTSA issued a new proposed standard.

2. As an NHTSA administrator you pushed the auto industry to improve the comfort and convenience of safety belts, did you not? Didn't automakers develop tension relievers or so-called windowshades in response to concerns about the comfort and convenience of safety belts?

Response: I did push automakers to improve the comfort and convenience of safety belts. In fact prior administrators, from the beginning of the agency, had urged belt design improvements and issued requirements for three point belts because of the difficult to use designs offered by the manufacturers.

The windowshade concept, of allowing the belt to retain slack while in use, was originated by the manufacturers and never required or urged by NHTSA. In fact, the agency made it abundantly clear in its internal and contract research work and its rulemaking that the windowshade system created unsafe slack and was not the best solution for improved comfort and convenience of belt systems. It may be the least expensive option for encouraging use but it is also unsafe. I doubt that any vehicle manufactured with the windowshade device that is crash tested at 30 mph under Federal Motor Vehicle Safety Standard 208 frontal crash would pass when the belt is adjusted with the slack.

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December 18, 1991

Mr. Byron Bloch
Auto Safety Design
7731 Tuckerman Lane
Potomac, Maryland 20854

Dear Mr. Bloch:

I want to express my personal appreciation to you for appearing before the Select Committee on Children, Youth, and Families at our hearing, "Automotive Safety: Is Enough Being Done to Protect America's Families?" held here in Washington on December 4, 1991. Your testimony was important to the work of the Committee.

The Committee is now in the process of preparing the transcript for printing. It would be helpful if you would go over the enclosed copy of your remarks to assure that they are accurate, and return the transcript by Monday, December 30, with any necessary corrections.

In addition, Representative Clyde C. Holloway, a member of the committee, has requested that you answer the following questions for inclusion in the printed record:

1) Materials distributed by committee staff describe you as an "auto safety design engineer." For the record, do you have any formal education in a field related to auto safety design? For whom have you been employed as an auto safety design engineer?

2) Page six of your testimony urges a warning label on windowshade seat belts, to be placed on the sun visor of Chevrolet and Ford cars with this type of seat belts, to all registered owners. Aren't you running the risk of reduced seat belt use? How do you encourage more people to comply?

Sincerely,

PATRICIA SCHROEDER
Chairwoman
Select Committee on Children,
Youth, and Families
Enclosure

Response From Byron Bloch to Questions Posed by Congressman Clyde C. Holloway

1. My formal education includes a Bachelor of Arts degree from the University of California, Los Angeles (UCLA) in 1961. My major field was Industrial Design. I then continued studies in the Master's Program at UCLA, also in Industrial Design.

   I have been employed as a consultant in Auto Safety Design by ROAD TEST Magazine (as Research Editor); by Automotive Safety Devices, Inc. (to assist in safety seat evaluation and testing); Inca Manufacturing Company (regarding energy-absorbing bumper systems); numerous law firms (regarding evaluation of alleged defective designs of motor vehicles); ABC Television News (to prepare and present Auto Safety Reports to the public).

2. I urge a warning label be placed on the sunvisors of GM and Ford vehicles that are equipped with slack-inducing "windowshade" type of seat belts. (Preferably, the cars should be recalled and these hazardous belts replaced with safer non-windowshade belts. Another recall option could be to disable or disconnect the slack-inducing windowshade feature)

   I don't believe there's a risk that such warning labels will cause reduced seat belt use. I think many people have avoided using such windowshade seat belts because they felt they were too loose to be effective in a crash anyway. Warning labels that prompt them to use their seat belt with a more secure, snug fit, would encourage more people to regularly wear such windowshade belts with more confidence in the belt's ability to safely restrain them in a crash accident.

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U.S. House of Representatives

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December 18, 1991

Mr. Benjamin Kelley
Institute for Injury Reduction
375 Prince George's Blvd., Suite 200
Upper Marlboro, MD 20772

Dear Mr. Kelley:

I want to express my personal appreciation to you for appearing before the Select Committee on Children, Youth, and Families at our hearing, "Automotive Safety: Is Enough Being Done to Protect America's Families?" held here in Washington on December 4, 1991. Your testimony was important to the work of the Committee.

The Committee is now in the process of preparing the transcript for printing. It would be helpful if you would go over the enclosed copy of your remarks to assure that they are accurate, and return the transcript by Monday, December 30, with any necessary corrections.

In addition, Representative Clyde C. Holloway, a member of the committee, has requested that you answer the following questions for inclusion in the printed record:

1) Do you get a salary or fee as president of the Institute for Injury Reduction? What percentage of your income is that? What percentage of your income comes from serving as an expert to plaintiffs in product liability cases? What percentage of your income is in no way related to product liability-related issues?

2) Do you have any skill, training or education which would establish expertise in the subjects about which you offer to testify today?

3) You state that NHTSA has had "totally unqualified and totally uncommitted leadership" since 1981. Isn't it true that the current NHTSA administrator has put in place more significant safety regulations than any of his recent

predecessors, including Ms. Claybrook (who testified at the hearing) and that unlike the experience of some of his predecessors, these regulations have not been seriously challenged or overturned?

Sincerely,

PATRICIA SCHROEDER
Chairwoman
Select Committee on Children,
Youth, and Families

Enclosure

Response From Benjamin Kelley to Questions Posed by Congressman Clyde C. Holloway

December 29, 1991

The Honorable Patricia Schroeder
U.S. House of Representatives
The House Select Committee on
Children, Youth and Families
385 House Office Building Annex 2
Washington, DC 20515-6401
Attn: Joan Godley, Clerk

Dear Chairwoman Schroeder:

Enclosed please find the transcript, with corrections, of my testimony before the Dec. 4 hearing on Automotive Safety.

Here are the answers to the questions raised by Rep. Holloway:

1. My salary from the Institute for Injury Reduction, which is a matter of public record under IIR's status as a tax-exempt organization, is $1,000 per year. No other part of my income is received from public-service work, and those parts of it that involve my work in the private sector, as a salaried employee of A. B. Kelley Corporation, are not relevant to this hearing and would be inappropriate for discussion in connection with it.

2. A copy of my biography and bibliography is attached and is responsive to this question.

3. No. The current administrator has held the office for only a relatively short period within the 1981-1991 time frame, but during that period he has failed to implement very important rulemaking actions in a number of areas which have been pending since prior to 1981, including the subjects of these hearings (windowshade prohibition, truck underride and hazardous automatic belt designs), utility vehicle rollovers, adjustable belt anchorages and many others. In addition, his failure to mandate front seat air bags in all new cars led Congress to enact such a requirement over his opposition.

His predecessors' records were even less impressive; most notoriously, they included a full-scale attack on then-pending passive restraint requirements which, if left in place, would have brought air bags into American cars in the very early 1980s. A Supreme Court decision was required to overturn this attempt to scuttle air bags and other passive restraints, and finally forced NHTSA and DOT to reinstate the standard. Administrator Claybrook's record, which you also mention, included adoption of that critically important regulation - probably the single most important rulemaking in NHTSA's history.

Mr. Curry has had an unparalleled opportunity to be an effective NHTSA administrator. His actions and attitudes - including those reflected in his refusal to testify at, send an agency witness to, or even attend this hearing - are eloquent evidence of his decision to forego that opportunity.

Yours cordially,

Benjamin Kelley

Enclosures

SUMMARY BIOGRAPHY:
BENJAMIN KELLEY

Benjamin Kelley is a nationally established authority on motor vehicle crashes and crash injuries. His experience includes service as a senior official of the federal highway and motor vehicle safety programs; overall policy and program management of a highly-regarded highway safety research organization; expertise as a witness before national and local legislative bodies, regulatory agencies and courts of law; and two decades of continuing activity as an author, lecturer, documentary film maker, analyst, investigator and commentator in the highway-motor vehicle crash field.

-- Mr. Kelley is President of the Institute for Injury Reduction, a non-profit research and educational group founded by plaintiff's attorneys to address issues involving product-related injuries. He is also President of A. B. Kelley Corporation, a consulting organization which he founded in 1984 to provide a range of advisory services in the safety and health fields.

-- From 1969 to 1984 he was Senior Vice President of the Insurance Institute for Highway Safety, and was a principal architect of its highly-regarded research and communications work. With the late William Haddon, Jr., M.D., a highway safety pioneer who was the Institute's president during the same period, he was intimately involved in the design, execution and interpretation of the organization's many groundbreaking research efforts, as well as in the conduct of its overall mission to reduce motor vehicle crash deaths, injuries and property damage.

-- From 1967 to 1969 Mr. Kelley was Director of the Office of Public, Legislative and Governmental Affairs for the U.S. Department of Transportation's highway, motor vehicle safety and highway safety programs within the U.S. Federal Highway Administration. In addition to founding and managing this office and its staff, he served as a policy advisor to the motor vehicle and highway safety bureau director and the federal highway administrator in issue areas involving motor vehicle and highway safety regulation, statutory consistency and intent, harmonizing and public interests.

A summary of Mr. Kelley's prior experience follows:

-- 1966-67: Manager, Transportation and Communications Policy Department, Chamber of Commerce of the United States -- responsible for analyzing and implementing Chamber policies involving transportation regulatory and legislative issues and developments.

-- 1963-66: Special Assistant to Interstate Commerce Commissioner William H. Tucker -- provided policy advice and execution in the areas of motor vehicle and rail regulation, including safety regulation; transportation company mergers, and government organization of transportation promotional and regulatory activities.

-- 1961-63: Transportation Editor, New York Journal of Commerce, Washington (DC) Bureau--responsible for coverage, editorial opinion concerning transportation regulation and legislation.

-- 1960-61: Reporter, Traffic World Magazine, Washington, D.C.--covered Interstate Commerce Commission regulatory activities; writer, Washington column, Automotive News magazine.

-- 1957-60: Editor/Reporter, Shipping and Trade News, Tokyo News Service, Tokyo, Japan.

-- 1954-57: Military Service: U.S. Army Security Agency/National Security Agency.

Education: Diplomas in Korean (U.S. Government Language School, Monterey, California), Japanese (Naganuma Institute, Tokyo, Japan). Course work at Sophia University, Tokyo, Japan. Special mid-career executive course, Harvard Business School.

Writing, Lecturing: Lecturer, 1979-present, Johns Hopkins University, School of Hygiene and Public Health. 1983 Roscoe Pound Foundation participant. 1990 American Assembly participant. (See attached bibliography for complete list of writing, testimony, lectures.)

Present, Past Memberships: National Coalition for Car Crash Injury Reduction; CRASH (Citizens for Reliable and Safe Highways)(Board of Directors); Center for Auto Safety (Board of Directors); National Safety Council (Board of Directors); American Public Health Association; National Press Club; American Association of Automotive Medicine; CINE (Board of Directors); Society of Automotive Engineers.

Awards, Recognitions: CINE Golden Eagle; Zagreb Film Festival; U.S. Department of Transportation Special Achievement Award; Who's Who In America.

PARTIAL BIBLIOGRAPHY
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BENJAMIN KELLEY

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U.S. House of Representatives

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December 11, 1991

The Honorable Jerry R. Curry
Administrator
National Highway Traffic Safety Administration
400 7th Street, S.W.
Washington, D.C. 20590

Dear Mr. Curry:

As you know, the Select Committee on Children, Youth, and Families held a hearing on Wednesday, December 4, 1991, on automotive safety, entitled: "Automotive Safety: Is Enough Being Done To Protect America's Families?"

Unfortunately, and for reasons which still do not make sense to me, the Select Committee was informed at the last minute that your agency would not be attending the hearing unless they appeared as the first witness. As chair of this Select Committee, I want to make my position on your agency's no-show perfectly clear to you. NHTSA is an agency created by the Congress, funded by the taxpayer, and subject to the oversight responsibility of this Committee. I am sure that you will agree that in the future, your agency will be more responsive to the Committee's requests and this type of last-minute maneuverings won't occur again.

Since your agency did not appear at the December 4th hearing, there were many questions regarding seatbelts and truck underride that were not able to be asked. Therefore, please respond by December 18, 1991, to the following questions in writing so that they can be submitted into the record of the December 4th hearing.

SEATBELT QUESTIONS

1. NHTSA's views regarding windowshade seatbelts have changed over the years. In 1979, NHTSA issued a rulemaking which called for the elimination of slack in the shoulder

portion of the belt system. Yet, this proposal was never enacted. Why?

2. In 1981, NHTSA issued a final rule on the comfort and convenience issue by stating that windowshade belts would be tested with their maximum amount of permissible slack, about 16 inches. However, this final rule was delayed for 4 years and changed to permit testing of the belt with the manufacturer's recommended amount of slack, about 1 inch, even though much more slack is routinely introduced into the seatbelt system. Why did NHTSA change its mind in the amount of slack it would allow to be tested? Upon what data did NHTSA base its decision? What was NHTSA's response to the National Transportation Safety Board's protest to this change in what amount of slack would be tested?

3. When the American auto industry wrote to your agency in 1988 stating that they were looking for better ways to reduce the potential for occupant "misuse" of windowshade belts, what was your agency's reaction to the industry's use of the word "misuse?" Isn't it true that windowshade belts introduce excess slack into the belt system during normal usage? How can something that happens from normal usage of the belt system be described as "misuse?" Is it NHTSA's position that it is the consumer's fault for having slack in the system?

4. When the American auto industry wrote to your agency and stated that they were going to eliminate these windowshade belts by 1991, what reason did they give? Didn't it seem odd that if these belts were working so well, that the industry would decide to stop using them?

5. In a July 13, 1987, Wall Street Journal article regarding windowshade seatbelts, NHTSA's Associate Administrator for Rulemaking, Mr. Barry Felrice, stated that "I see people riding around with their (shoulder) belts really loose. They just as well not be wearing one." This statement tells me that over 4 years ago, your agency was aware of the danger of slack in the windowshade belt. Don't you think that NHTSA and the American auto industry should initiate an intensive and thorough public information campaign to warn the drivers of more than 50 million cars of the inherent danger of the belt systems that they are relying on to protect them?

6. What is NHTSA currently doing to inform the public about the inherent dangers associated with windowshade seatbelts?

7. NHTSA was supposed to release a report late this year which discusses the inferior protection provided by some passive seatbelt systems that were permitted under the 1984

Federal Motor Vehicle Safety Standard 208. Is this report finished? If not, why not? When will it be finished?

TRUCK UNDERRIDE QUESTIONS

1. NHTSA proposed a truck underride rule in 1967, 1969, 1970, 1977, and 1981, always noting that many needless deaths and severe injuries could be prevented by suitable underride guards at the rear of large trucks and trailers. It is now more than 24 years after the first NHTSA proposal and 10 years after the upgraded, well-supported 1981 proposal. Yet, NHTSA still has not issued a truck underride guard rule. Why has NHTSA delayed a truck underride guard rule for more than 24 years? What could possibly cause this long of a delay?

2. NHTSA and automotive industry crash tests conducted back in 1969 and 1970 showed that a suitable truck underride guard could prevent the rear structure of a large truck from crashing into the passenger compartment of a car in a rear-end collision. Didn't these tests, conducted over 20 years ago, convince NHTSA that a solution to the underride guard problem was in-hand?

3. The Insurance Institute for Highway Safety conducted a series of crash tests in 1976 with the existing ICC guards and improved underride guards and showed the dramatic life-saving difference that an effective underride guard would make. Later, in 1979, NHTSA spent $578,000 for a series of crash tests that pointed out how a stronger, wider, and lower-to-the-ground underride guard could prevent a large truck from penetrating the passenger compartment of even a small car. Why didn't NHTSA proceed ahead in the 1980s by mandating that such underride-prevention safety guards be required?

4. According to NHTSA's recent analysis, there have been at least 136 deaths per year in truck underride accidents over the past 10 years. In addition, tens of thousands of people have been seriously injured in such accidents. How does NHTSA justify its continuing delay in failing to issue a final rule that would require these underride safety guards?

5. Improved truck underride prevention devices were implemented in Sweden in the 1970s and then extended into Great Britain and most of Europe in the early 1980s. With the rest of the world moving ahead with regulations, directives, and actual installation of truck underride prevention devices, why does America's vehicle safety agency not do the same?

6. In the long history of this on-again, off-again truck underride proposal, cars have gotten smaller and lower. Yet,

the NHTSA proposed underride guard height has gone in the opposite direction--from 18 inches above the ground in 1969 to NHTSA's current strategy to accept 22 inches above the ground. Why does NHTSA favor a 22 inch height for a rear underride guard when it knows that perhaps 40 to 50 percent of the cars on the road will go beneath such a guard height and cause excessive penetration into the passenger compartment?

Thank you for your cooperation in this matter. If you have any questions, please call Mr. Tim Morrison or Ms. Mickey Uelses at (202) 226-7660.

Sincerely,

PATRICIA SCHROEDER
CHAIRWOMAN
SELECT COMMITTEE ON CHILDREN,
YOUTH, AND FAMILIES

US Department
of Transportation

National Highway
Traffic Safety
Administration

Administrator

400 Seventh Street, S.W.
Washington, D.C. 20590

DEC 3 1 1991

The Honorable Patricia Schroeder
Chairwoman, Select Committee
on Children, Youth, and Families
United States House of Representatives
Washington, DC 20515-6401

Dear Madam Chairwoman:

Enclosed are the answers to questions contained in your letter on seatbelts and truck underride.

Sincerely,

Jerry Ralph Curry

Enclosure

RESPONSE FROM JERRY CURRY TO QUESTIONS POSED BY CHAIRWOMAN PATRICIA SCHROEDER

SEATBELT QUESTIONS

Tension Relievers

Prior to answering your specific questions, we believe it appropriate to provide a brief statement of this agency's position on tension relievers, or "windowshade," devices. First, it must be understood that the most effective means of reducing highway casualties is the wearing of safety belts. Accident data analyses have shown that front seat lap/shoulder belts are 40-50 percent effective in reducing fatalities, compared to unrestrained occupants. However, belt usage in the late 1970's and early 1980's hovered around the 10-15 percent range. Thus, the primary goal of the agency at that time was to increase belt usage.

Study after study concluded that two of the primary reasons that people did not wear belts were the incorrect fit (e.g., cutting across the occupant's neck) and uncomfortable pressure of the belts. In an attempt to address these problems, manufacturers introduced devices which, with the introduction of a minimum amount of slack, could address these issues and result in higher belt usage. This was a laudable goal -- increasing belt usage -- and one which was supported by all agency Administrators over the past 15 years.

At the same time, it was recognized that excessive slack would reduce belt effectiveness. The question then, was, on balance, did tension relievers -- with their propensity to increase belt usage but slightly decrease effectiveness if excessive slack were introduced -- yield net safety benefits to the motoring public?

Because of the myriad factors affecting belt usage, tension relievers could not be convincingly shown to increase belt usage (there were some studies which demonstrated higher belt usage). Nevertheless, since tension relievers addressed two of the principal reasons why people did not wear belts, logic would dictate that some number of people wore their belts who otherwise would not have. At the same time, NHTSA studies showed that excessive slack was exhibited by less than two (2) percent of belt wearers. At this rate, if tension relievers increased usage by as little as one percentage point, they would yield net safety benefits.

As a result, NHTSA neither prohibited nor advocated the use of tension relievers. Instead, NHTSA consistently allowed their use, while it actively informed consumers that belts must be worn snugly to be most effective. While excessive slack can degrade belt effectiveness, a belt not worn has zero effectiveness. Tension relievers were intended to increase belt usage. While there have not been studies that have shown that tension relievers have demonstrably improved motor vehicle safety, there

have also not been studies that have shown that they degrade safety. In essence, this agency strongly believes that the effect of tension relievers on safety is basically unknown, allegations on both sides to the contrary. We believe that the public needs to be continually advised that belts must be worn properly, and we encourage the Committee to use its resources to help the agency deliver this message.

QUESTION #1.: NHTSA's views regarding windowshade seatbelts have changed over the years. In 1979, NHTSA issued a rulemaking which called for the elimination of slack in the shoulder portion of the belt system. Yet, this proposal was never enacted. Why?

ANSWER: We do not believe that the agency's policy on tension relievers -- or "windowshade" devices -- has changed over time. The agency's policy has consistently been to increase belt usage, while minimizing decreased effectiveness of belts when used.

For example, in an Advance Notice of Proposed Rulemaking on belt comfort and convenience issued in 1976 (41 FR 54961, December 16, 1976, copy enclosed), NHTSA stated that "improved comfort and convenience would increase belt usage and thus contribute to motor vehicle safety." The agency further recognized that it was essential to "balance comfort and convenience considerations against potential loss of safety performance..." As to tension relievers, the agency indicated they "might be allowed if they retract automatically...whenever the assembly is unfastened and the belt released, and whenever the door is opened." The agency went on to recognize that "excessive slack...is an argument against permitting their use" and specifically sought comments on this issue.

In its next rulemaking notice, an NPRM issued in December 1979 (44 FR 77210, December 31, 1979), NHTSA noted the continual low usage of safety belts and the prominence of comfort/convenience issues being reasons for the low belt usage. The NPRM noted that "Any comfort or convenience problem which is beyond the capability or willingness of the potential user to tolerate can...create a non-user." The agency noted that "Many belts...do not fit properly (e.g., cross the occupant's neck, apply too much pressure...)." These are the very problems which tension relievers address.

In this NPRM, NHTSA believed that the proposal to limit belt contact force to 0.7 lbs. "would serve essentially the same purpose...as...'window-shade devices'." "Therefore...this notice proposes to eliminate...devices that allow the introduction of slack in the belt webbing of an upper torso restraint." The notice went on to specifically request comment on "methods to preclude excessive slack if...'window-shade-devices' continue to be permitted..."(emphasis added).

In responding to comments to the above NPRM, NHTSA noted that "there is some merit to [manufacturer] arguments" that some amount of slack should be permitted and that the 0.7 lb. belt contact force was not an adequate surrogate (46 FR 2071, January 8, 1981). The final rule issued by the agency in January 1981 clearly stated that "tension-relieving devices are not prohibited..."(emphasis added). Thus, the agency first asked if tension relievers should be banned and then concluded that they should not be.

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While the rule issued in January 1981 would have effectively banned tension relievers in automatic belts, (requiring them to be tested with the maximum amount of slack that it was possible to induce), it specifically allowed them for manual belt systems ("The agency does urge manufacturers to voluntarily limit the amount of slack that can be introduced in their manual belt systems" (emphasis added). Thus, all light trucks and vans and all passenger cars with air bags would have continued to be allowed to have tension relievers under the January 1981 rule.

In 1985 (50 FR 46056, November 6, 1985) the 1981 rule was further amended. As noted above, the 1981 rule required the dynamic testing of vehicles with tension relievers in their automatic belts to be tested with the maximum amount of slack that could possibly be introduced into the system. Several manufacturers objected to this provision, arguing that the standard's injury criteria would have to be met even when the tension relievers were misused to produce excessive slack in order, essentially, to defeat the system. The agency found this requirement "unduly stringent" and amended the rule to require testing with whatever amount of slack the manufacturer recommended could be safely introduced into the system. Furthermore, the rule required that the vehicle's owner's manual state this maximum amount of safe slack, explain how the tension reliever works and "warn that introducing slack beyond the specified amount could significantly reduce the effectiveness of the belt in a crash" (49 CFR 571.208 S7.4.2) (emphasis added).

Thus, vehicle owners were required by regulation to be warned that belts must be worn snugly for maximum protection and they were informed how to eliminate belt slack if it became excessive.

While some allege that most people did not read owner's manuals, we disagree. Furthermore, the Congress itself, in the recently enacted NHTSA Authorization Act of 1991, required the agency to inform the public, via statements in vehicles' owners' manuals, that safety belts must be worn all the time, and that air bags offer supplemental protection to that provided by belts, and are not substitutes for them. Thus, the Congress itself recognizes the value of information provided in owners' manuals.

Finally, the agency in 1986 corrected a deficiency in the 1981 rule by extending its requirements for tension relievers to manual belt systems (51 FR 9800, March 21, 1986). Thus, all light trucks and vans and vehicles with air bags (which usually have manual belts) were now covered -- more than doubling the number of vehicles subject to the standard.

Atttachment 1 contains copies of the above-mentioned notices.

QUESTION #2.: In 1981, NHTSA issued a final rule on the comfort and convenience issue by stating that windowshade belts would be inches. However, this final rule was delayed for 4 years and changed to permit testing of the belt with the manufacturer's recommended amount of slack, about 1 inch, even though much more slack is routinely introduced into the seatbelt system. Why did NHTSA change its mind in the amount of slack it would allow to be tested? Upon what data did NHTSA base its decision? What was NHTSA's response to the National Transportation Safety Board's protest to this change in what amount of slack would be tested?

ANSWER: The final rule issued in 1981 would have required the dynamic testing of vehicles with automatic belts with any tension relievers in such belts adjusted to introduce as much slack as possible. In some vehicles, as much as 16 inches of slack could physically be introduced. As noted in the previous answer, tension relievers in vehicles with manual belts (such as those with air bags and light trucks and vans) were not regulated by the 1981 rule.

The agency amended the 1981 rule in 1985 to require testing (in vehicles with automatic belts) with the tension relievers being adjusted to the maximum amount of slack that could be safely introduced into the system, as recommended by manufacturers in the owner's manual. This amount is typically about one inch. This change was based on manufacturer comments contained in petitions for reconsideration of the 1981 rule. Manufacturers argued that it was highly unlikely that consumers would introduce the maximum amount of slack that the system was physically capable of accommodating (e.g., 16 inches). Thus, such testing was unreasonable. The agency, in the 1985 amendment, found such arguments persuasive and termed the 1981 rule "unduly stringent" in this regard. The amendment was based on the petitions for reconsideration, not on additional accident or test data.

On June 14, 1985, the National Transportation Safety Board registered its objection to the proposed change of testing vehicles with tension relievers from the original "any position to which it could be adjusted" to "that is recommended by the vehicle manufacturer in the owner's manual..." The Safety Board's objection was based on their conclusion that "many users who do not know how to use this system correctly introduce excess slack, and ... the owner's manual is not a sufficient guarantee of proper use." The agency did not agree with this position. In the Final Rule, on November 6, 1985, the agency concluded that "the occupant should notice that excessive slack is present and a correction ius needed regardless of whether he or she has read the vehicle's owners manual."

We believe that tension-relievers may in fact prevent safety belt misuse and, moreover, may prevent safety belt non-use. These devices make safety belts more comfortable for small adults and children. With have received an increased number of complaints os safety belt discomfort for smaller people.

QUESTION #3.: When the American auto industry wrote your agency in 1988 stating that they were looking for better ways to reduce the potential for occupant "misuse" of windowshade belts, what was your agency's reaction to the industry's use of the word "misuse?" Isn't it true that windowshade belts introduce excessive slack into the belt system during normal usage? How can something that happens from normal usage of the belt system be described as "misuse?" Is it NHTSA's position that it is the consumer's fault for having slack in the system?

ANSWER: It is the agency's position that the term "misuse," as it relates to this subject, refers to responsibilities of both the manufacturer and the consumer. Manufacturers are responsible for providing safety belts that meet the safety performance requirements set out in our standards. They are also responsible for including in the owner's manual specific information on the operation and use of a safety belt system that incorporates a tension relieving device. Consumers are responsible for properly utilizing the safety belts installed in their vehicles. In addition to information supplied by the manufacturer, this agency provides information to the public on safety belt use in general and information on the proper use of the tension relieving device in particular.

While windowshade devices can inadvertently induce slack, it is unlikely that the maximum amount that can physically be introduced can be introduced by the system itself. Such excessive slack (e.g., 16 inches) would occur as the result of the occupant acting deliberately.

Thus, we believe that "excessive" slack is often caused by a combination of the system itself plus consumer action. We do not believe it is the fault of the consumer that small amounts of slack are introduced into the system. Thus, we required warnings in owner's manuals and instituted consumer information programs to advise consumers on correct usage.

QUESTION #4.: When the American auto industry wrote to your agency and stated that they were going to eliminate these windowshade belts by 1991, what reason did they give? Didn't it seem odd that if these belts were working so well, that the industry would decide to stop using them?

ANSWER: On September 7, 1988, NHTSA wrote to Chrysler, Ford, and General Motors (GM), referencing the National Transportation Safety Board's report on belt usage which adversely commented on the role of belt slack in inducing injury. The agency sought information on these manufacturers' plans regarding future use of tension relievers so as to enable NHTSA to factually respond to the Board's report.

Each of the companies provided its future plans regarding these devices (the individual responses are enclosed as Attachment 2). Chrysler indicated that by the 1990 model year (MY), tension relievers would not be used except on two light truck models. Chrysler indicated that "new belt systems have been refined to minimize friction so that the amount of tension required to retract the belt when it is unbuckled is substantially reduced." Thus, Chrysler believed that advancement in belt technology reduced the need to continue to produce tension relievers.

Ford stated that tension relievers would be removed "from all of its safety belts by September 1, 1989 [MY 1990]." Ford did not provide a reason for its phase-out of tension relievers.

GM indicated that they are continually looking for improvements to their belt systems. GM stated that certain "restraint design concepts we are considering for the future might help increase the level of perceived comfort...without the use of a tension relieving device." In an amendment submitted on September 1, 1989, GM indicated that "multiple factors -- mandatory belt laws, education programs and a rising level of driver safety awareness -- have combined to increase and sustain higher usage rates. Therefore, GM is currently reducing its usage of [tension relievers]."

The spread of mandatory use laws and their enforcement, coupled with the increased awareness of the public about safety in general, led to increases in belt usage from 10-15 percent in the early 1980's to nearly 50 percent in 1988. As a result, the incremental usage effect of tension relievers seemed inconsequential with respect to these more powerful inducements. Thus, manufacturers apparently felt that it was no longer necessary to take advantage of the use-inducing features of tension relievers.

QUESTION #5.: In a July 13, 1987, Wall Street Journal article regarding windowshade seatbelts, NHTSA's Associate Administrator for Rulemaking, Mr. Barry Felrice, stated that "I see people riding around with their (shoulder) belts really loose. They just as well [might] not be wearing one." This statement tells me that over 4 years ago, your agency was aware of the danger of slack in the windowshade belt. Don't you think that NHTSA and the American auto industry should initiate an intensive and thorough public information campaign to warn the drivers of more than 50 million cars of the inherent danger of the belt systems that they are relying on to protect them?

ANSWER: NHTSA has been aware for at least 15 years of the trade-offs between higher usage and the potential for decreased effectiveness. As noted earlier, the agency's ANPRM in 1976 noted that there was a need to "balance comfort and convenience considerations [e.g., tension relievers] against potential loss of safety performance" [41 FR 54961, December 16, 1976].

Also, the agency has long attempted to inform the public of the need to wear belts properly; i.e., as snug against the torso as possible. We have not only mandated that owners' manuals inform consumers of the maximum amount of safe slack to be introduced into the belt system, but in an attempt to limit that amount, we have stated that we will dynamically test the vehicle with the maximum amount of slack recommended by the manufacturer. As a result, manufacturers recommended that no more than 1 inch of slack be introduced. One inch of slack has no significant effect on occupant safety.

Also, all of the agency's consumer information brochures, reports, instructional documents, etc. that are distributed to the public, educators, physicians, the law enforcement community, et al, stress that belts should be worn with a minimal amount of slack so as to provide maximum occupant protection. Safety belts equipped with tension relievers, when worn properly, do not impose any "inherent danger," as your question implies. We hope that the Committee will join the agency and the safety community in advising consumers to wear their belts properly, so as to obtain the maximum safety benefit possible. Informed consumers should be assured that they are adequately protected.

QUESTION #6.: What is NHTSA currently doing to inform the public about the inherent dangers associated with windowshade seatbelts?

ANSWER: Again, we want to repeat that safety belts equipped with tension relievers, when worn properly, do not impose any "inherent danger." As stated in response to the previous question, the agency's consumers information bulletins and documents that are distributed to the public indicate the proper manner in which to wear safety belts and stress that safety belts equipped with tension relievers should be worn with a minimal amount of slack. We urge the Committee to join us in so informing the public.

NHTSA encourages correct use of safety belts through publication and distribution of consumer information. We provide this and other information on correct use to the public directly and through health and safety professionals such as physicians and nurses, as well as through state and local government agencies. Agency officials also promote correct safety belt use at every available forum.

For example, our Consumer Information Bulletin on the proper use of safety belts explains that some manufacturers have installed tension relieving devices in the belt systems and provides specific information on how to use them properly. A copy of the bulletin is attached. This bulletin is distributed to the public through our Auto Safety Hotline and to consumers who call our offices requesting information on safety belt use. Approximately 5,000 of these bulletins have been distributed to the public over the last three years.

This agency's concern on the proper use of safety belts by consumers is carried over in our public service releases that are utilized in newspapers and magazines. Examples of these releases are attached and emphasize: "Wear it right! Shoulder belts should be snug. Don't allow more than 1 inch of slack."

The Committee is being provided with two other reports as examples of how the agency works with health and safety professionals in supplying them with information on the proper manner in which to wear safety belts and in particular the proper way to correctly utilize any tension relieving feature. One is titled "Sudden Impact" and the other is titled "Protecting Our Own."

Also, we require manufacturers that utilize tension relieving devices to place information in the vehicle owner's manual as to the proper operation of the device and the recommended amount of slack and "warn that introducing slack beyond the specified amount could significantly reduce the effectiveness of the belt in a crash" (49 CFR 208 S7.4.2).

Attachment 3 contains the above-referenced material.

QUESTION #7.: NHTSA was supposed to release a report late this year which discussed the inferior protection provided by some passive seatbelt systems that were permitted under the 1984 Federal Motor Vehicle Safety Standard 208. Is this report finished? If not, why not? When will it be finished?

ANSWER: NHTSA's report is not about "the inferior protection provided by some passive seatbelt systems." The report is an evaluation of the "real-world" costs and benefits of the agency's 1984 amendments to FMVSS No. 208. In our report, we plan to develop estimates of the actual effectiveness, in crashes, of the various types of restraint systems manufacturers have used to meet the requirements of the 1984 amendments, as well as an assessment of the costs of these systems. This analysis requires substantial accident data to reach statistically significant conclusions on the level of occupant protection provided by each type of restraint system. We have revised our schedule for the evaluation because there are still not enough cases available to provide results about the effectiveness of automatic belts. We will do further analyses when more 1991 crash data are available. New target dates for a report have not been established, but we hope to complete a report in 1992.

TRUCK UNDERRIDE QUESTIONS

QUESTION #1.: NHTSA proposed a truck underride rule in 1967, 1969, 1970, 1977, and 1981, always noting that many needless deaths and severe injuries could be prevented by suitable underride guards at the rear of large trucks and trailers. It is now more than 24 years after the first NHTSA proposal and 10 years after the upgraded, well-supported 1981 proposal. Yet, NHTSA still has not issued a truck underride guard rule. Why has NHTSA delayed a truck underride guard rule for more than 24 years? What could possibly cause this long of a delay?

ANSWER: First, we are unable to reconstruct all agency actions on this subject since 1967 as those responsible are no longer employed here. What we can say is that this Administration is treating the subject of truck rear underride devices seriously. We stated publicly in our Priority Plan issued in 1990 that in 1991 we would make a regulatory decision on this subject. In the 1991 version of the Plan, we stated that the regulatory decision would be made in the summer of 1991. We met that commitment, having decided to issue a supplemental notice to the one issued in 1981. This decision was announced in a public meeting held in Detroit on August 20, 1991, a transcript of which is publicly available for those who could not attend the meeting and which is included in attachment 4. We also noted in our recently issued conspicuity NPRM that we expected to soon issue a notice on truck underride. The underride proposal was cleared by OMB on December 26, 1991, and it should be published in the Federal Register during the week of December 30, 1991. Attachment 5 is the supplemental NPRM.

Second, while some advocates would have the agency focus solely on the potential safety benefits of its rulemakings, the law does not permit this single focus. NHTSA's authorizing legislation requires that its standards be "practicable." Legislative history and court decisions have led us to conclude that the term not only includes the capability of producing the required safety performance, but also a balancing of benefits and costs, which is also specifically required by Presidential Executive Order. Furthermore, the Administrative Procedure Act, which governs all rulemaking, requires that agencies be responsive to public comments on their proposals.

This process was ably summed up by Chairman Dingell, in an October 8, 1991, oversight hearing of NHTSA, wherein he said that "Regulations must be made with care to consider the rights and interests of all persons, the consumers as well as the manufacturers...The process of making regulations...is something that takes an enormous amount of time and is subject to an enormous number of vagaries. That includes...the requirements...with regard to due process, the development of an adequate record, the gathering of appropriate information upon which you may properly act and, of course, the requirements of

due process and the supervision of the Congress and the courts."

The above, of course, does not mean that it should take decades to decide regulatory issues. In the case of truck underride, NHTSA did decide, in 1970, to no longer pursue this issue, as it felt that the benefits were not commensurate with the costs. While one can disagree with that decision, it was a decision and, thus, it is not accurate to imply that this rulemaking was pending for all those years.

Since the 1981 NPRM, the agency has concentrated on two major aspects of the truck underride issue. The first concerns the subject of truck conspicuity. Clearly, it is more desirable to prevent rear-end crashes into heavy trucks than to minimize the consequences when they occur. The agency specifically mentioned this activity in the 1981 notice. Commenters to the docket strongly suggested that NHTSA consider a conspicuity rule as a substitute for underride protection. As a result, the agency embarked on a fleet study to evaluate the effects of conspicuity treatments (e.g., reflectorized tape). The time for the procurement process, the actual fleet test, and comments on the study, consumed several years, and these activities were not finished until 1988. An NPRM on that subject was published on December 4, 1991.

The second subject was the concern of small (in size of number of employees) trailer manufacturers that the destructive testing of the underride guards was too costly for them and thus not "practicable," as required by law. The Regulatory Flexibility Act, P.L. 96-354, September 19, 1980, required regulatory agencies to specifically consider the effects of their rules on small businesses. As noted in attachment 4,while the top 25 trailer manufacturers produce 38 percent of all trailers, the remaining 17 percent is produced by over 200 firms. Fifty of these firms produce 20 or fewer trailers per year, and 35 of them produce fewer than 10. Thus, most trailer manufacturers are small businesses whose needs had to be specifically addressed. Hence, the 1981 proposal had to be amended to accomplish this goal.

Again, this Administration has stated that truck rear underride is an agency priority, has announced its schedule to resolve the remaining issues, and has met its commitments.

QUESTION #2.: NHTSA and automotive industry crash tests conducted back in 1969 and 1970 showed that a suitable truck underride guard could prevent the rear structure of a large truck from crashing into the passenger compartment of car in a rear end collision. Didn't these tests, conducted over 20 years ago, convince NHTSA that a solution to the underride guard problem was in-hand?

ANSWER: The results of heavy truck underride protection research in the 1969-1970 time frame and other information convinced the agency that effective underride guards were worthy of further consideration. That is, guards capable of preventing passenger compartment intrusion that can occur when a small passenger vehicle collides with the rear of a heavy truck or trailer, were technically feasible.

The agency issued notices in 1969 and 1970 proposing underride protection guards for heavy trucks and trailers. These notices were based on the physical research mentioned in your question. However, many of the comments to these notices stated that the anticipated injury and fatality reduction benefits of the proposals were insufficient when compared with the projected costs associated with the development and installation of the guards and the payload capacity lost due to the weight of the guards. Based on the comments received and the evaluation of cost and accident data, the agency concluded that, at that time, the safety benefits achievable in terms of injury and fatality reduction would not be commensurate with the cost of implementing the proposed requirements.

QUESTION #3.: The Insurance Institute for Highway Safety conducted a series of crash tests in 1976 with the existing ICC guards and improved underride guards and showed the dramatic life-saving difference that an effective underride guard would make. Later, in 1979, NHTSA spent $578,000 for a series of crash tests that pointed out how a stronger, wider, and lower-to the-ground underride guard could prevent a large truck from penetrating the passenger compartment of even a small car. Why didn't NHTSA proceed ahead in the 1980s by mandating that such underride-prevention safety guards be required.

ANSWER: See answer to truck underride question No. 1. Further, NHTSA did proceed with rulemaking in the 1980s by issuing an NPRM on Jan. 8, 1981 which proposed performance requirements for underride protective devices on most trucks and trailers that have gross vehicle weight ratings greater than 10,000 pounds.

Some commenters objected to the proposed requirements and suggested alternative means to reduce the deaths and injuries associated with underride crashes, such as by reducing the incidence of such crashes by improving the conspicuity of heavy vehicles. As a result of those comments, NHTSA undertook research on whether the potential reduction in fatalities that might be achieved by underride guards could be achieved by improved conspicuity as well.

Comments on the NPRM also expressed concerns that the proposed requirements would impose substantial burdens on trailer manufacturers. The trailer manufacturing industry consists of many firms that vary widely in size and engineering capabilities. Some of the firms may lack the financial or technical resources to conduct the vehicle-based test that was proposed in the NPRM. As a result of the comments, the agency sought to determine whether it could revise its proposal to reduce the burden on small manufacturers.

QUESTION #4.: According to NHTSA's recent analysis, there have been at least 136 deaths per year in truck underride accidents over the past 10 years. In addition, tens of thousands of people have been seriously injured in such accidents. How does NHTSA justify its continuing delay in failing to issue a final rule that would require these underride safety guards?

ANSWER: The agency's analysis of fatalities in which a passenger car or light truck "underrode" a heavy truck, averaged 134 for the 8-year period 1982-89. We are unaware of data which indicate that "tens of thousands of people have been seriously injured in such accidents". Our information shows that in rear-end crashes into heavy trucks, there are only about 800-900 injuries per year to light duty vehicle occupants which are coded as "serious" or above. However, only a small percentage of these (approximately 10 percent) involve "underride". The remainder are rear-end, non-underride-caused injuries.

Also, half of the underride fatalities occur in side crashes. The agency has never considered a side underride rulemaking. Nor does any other country have a side underride standard. Thus, the fatality magnitude associated with rear underride is approximately 60 per year. Based on European experience and agency research and analyses, we could expect to reduce this number by abut 15 percent, or 9-10 lives per year.

As stated previously, this Administration is not delaying rulemaking on this subject. We have consistently pointed out our intention to move on this issue and have met all our commitments to do so.

QUESTION #5: Improved truck underride prevention devices were implemented in Sweden in the 1970s and then extended into Great Britain and most of Europe in the early 1980s. With the rest of the world moving ahead with regulations, directives, and actual installation of truck underride prevention devices, why does America's vehicle safety agency not do the same?

ANSWER: While Sweden and Great Britain have mandatory requirements for heavy truck underride protection guards, it is our understanding that the majority of the member countries of the European Economic Community (EEC) and the Economic Commission for Europe (ECE) do not require truck underride protection. ECE Regulation No. 58 and EEC Directive 79/490 are similar heavy truck underride protection standards "adopted" by the respective member countries. NHTSA is in the process of determining which European countries actually require truck underride protection. Adoption or endorsement of an EEC directive or an ECE regulation does not obligate a country to enforce it.

As we have frequently stated, this Administration has committed to address the underride issue and we are meeting our commitments. In our priority plan, we have stated that we would reach a regulatory decision on the matter this past summer. We did reach and announce that decision. A Supplemental Notice of Proposed Rulemaking (SNPRM) addressing the concerns raised in comments to the 1981 NPRM was issued on December 26, 1991.

QUESTION #6: In the long history of this on-again, off-again truck underride proposal, cars have gotten smaller and lower. Yet, the NHTSA underride guard height has gone in the opposite direction--from 18 inches to 22 inches above the ground. Why does NHTSA favor a 22 inch height for a rear underride guard when it knows that perhaps 40 to 50 percent of the cars on the road will go beneath such a guard height and cause excessive penetration into the passenger compartment?

ANSWER: There are many trade-offs that enter into any decision as to what is an appropriate maximum guard height-above-the-ground requirement. Obviously, if one looks at only the safety of underriding vehicles, zero ground clearance provides the most protection. This is clearly impractical, as a truck needs sufficient underride guard ground clearance to perform its functions, such as loading and unloading at docks, clearing ramps and other obstacles, etc. In general, the higher the guard ground clearance the greater performance flexibility a truck has.

In NHTSA's January 1981 NPRM, the agency expressed the view that a 21.65 inch maximum underride ground clearance requirement would adequately balance both underride protection and truck performance requirements. The agency believed this ground clearance allowed trucks the flexibility to perform most of the tasks they need to perform and also assured that the guard would be low enough to pick up the significant load paths of the underride vehicle structure.

We do not believe that an 18 inch ground clearance requirement is a key issue. Car bumpers essentially prevent cosmetic damage during low speed crashes. During higher intensity crashes that have the potential to produce significant injury, the energy dissipated by the bumper is insignificant when compared to the energy dissipated by other load paths. What is necessary is that an underride guard engage the main structural members of the underriding car such as the engine, and not the vehicle's bumper.

Also, NHTSA has no information indicating that 40 to 50 percent of the cars on the road will go beneath a 22 inch height guard.

We would like to also point out that there are other geometric requirements -- such as the width of the guard relative to the trailer's width -- and performance requirements -- such as the energy-absorbing capacity of the guard -- that are just as, if not more important, than guard ground clearance. These issues are all being addressed in our recently issued underride notice.

In addition, in your letter you point out that Sweden, Great Britain, and most of Europe have moved ahead with underride prevention devices while the United States has not. The Committee's letter suggests that NHTSA should follow their example. The agency notes that, to our best knowledge, all these countries require maximum underride guard ground clearances of approximately 22 inches (55 centimeters), the same value being condidered by us.

[Attachments referred to in NHTSA's response are retained in committee files.]

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December 10, 1991

The Honorable Jerry R. Curry
Administrator
National Highway Traffic Safety Administration
400 7th Street, S. W.
Washington, D.C. 20590

Dear General Curry:

Pursuant to Rule XI of the U. S. House of Representatives, the Select Committee on Children, Youth, and Families is conducting an inquiry into NHTSA's rulemaking concerning the issue of truck underride protection. As an aid in this inquiry, we request that NHTSA provide the following information to the Committee no later than December 20, 1991:

1. Copy of October 14, 1967, Advance Notice of Proposed Rulemaking (ANPRM) regarding truck and trailer underride.

2. Copy of March 19, 1969, Notice of Proposed Rulemaking (NPRM) on rear truck underride; summary of comments to the docket on the NPRM. Results of crash tests conducted by NHTSA at this time. Copy of NHTSA study conducted by Cornell Aeronautical Laboratory, Inc., now CALSPAN, on "Underride/override of Automobile Front Structures in Intervehicular Collisions".

3. Copy of June 10, 1971, Federal Register Notice of Termination of Rulemaking on truck underride. Copy of National Transportation Safety Board's comments to NHTSA urging NHTSA to renew its plans to require underride protection.

4. Copy of 1972 cost/benefit rationale for terminating NPRM.

5. Copy of August 29, 1977 ANPRM on rear end underride protection. Copy of summary of comments to the docket.

6. Copy of September 1980 NHTSA report "Development of Compliance Test for Truck Rear Underride Protection".

7. Copy of January 1981 NPRM on Rear Underride Protection. Summary of comments to the docket.

8. Current status of 1981 NPRM. Chronology of review process and action taken each time NPRM went to Office of the Secretary of Transportation, Office of Management and Budget, and back to NHTSA together with comments from Office of the Secretary and Office of Management and Budget.

9. What objections, if any, does OMB have to the proposed rule?

10. Have all reviews been conducted?

11. When will the final rule be published?

12. In NHTSA's Highway Safety Priority Plan, a regulatory decision on rear truck underride was expected to be made by Summer of 1991. What led the agency to believe it would meet this goal?

We appreciate your cooperation in this inquiry. Please contact Tim Morrison or Mickey Uelses of the Committee staff if further information is needed.

Sincerely,

PATRICIA SCHROEDER
Chairwoman

US Department
of Transportation

**National Highway
Traffic Safety
Administration**

Administrator

**400 Seventh Street, S.W.
Washington, D.C. 20590**

DEC 30 1991

The Honorable Patricia Schroeder
Chairwoman, Select Committee
on Children, Youth, and Families
United States House of Representatives
Washington, DC 20515-6401

Dear Madam Chairwoman:

Enclosed are responses to the questions in your recent letter on truck underride devices.

Sincerely,

Jerry Ralph Curry

Enclosures

RESPONSE OF JERRY R. CURRY TO QUESTIONS POSED BY CHAIRWOMAN PATRICIA SCHROEDER

The material requested by items 1-7 of the Committee's letter is attached. Please note that:

- Item 2, summary of comments to the docket on the March 19, 1969, NPRM, is not available. We have checked both NHTSA and FHWA dockets (NHTSA was part of FHWA at the time), as well as with current and former employees, and a docket summary does not appear to have been prepared. We would be pleased to provide the individual docket comments to the Committee if desired.

- The notice of termination of rulemaking was dated June 18, 1971, not June 10, as indicated in item 3. We have also included the Safety Board's January 12, 1972, letter to NHTSA asking the agency to reconsider its termination of rulemaking. The agency's February 14, 1972, response to the Board is also included.

- As with item 2, we could not locate a summary of docket comments to the ANPRM issued in 1977, as requested in item 5. However, the individual comments are available if the Committee desires them.

- The material requested in items 1-7 follows the answers to your questions in items 8-12.

QUESTION #8: Current status of 1981 NPRM. Chronology of review process and action taken each time NPRM went to Office of the Secretary of Transportation, Office of Management and Budget, and back to NHTSA together with comments from Office of the Secretary and Office of Management and Budget,

ANSWER: The agency's subsequent regulatory action to the issuance of the 1981 NPRM, was the preparation of a supplemental NPRM, which addresses public concerns expressed to that earlier notice. This supplemental notice was submitted to the Office of the Secretary of Transportation on August 1, 1991. There were not any earlier submittals. It was returned to NHTSA on August 28, 1991 to add questions to the preamble concerning the limitation of the SNPRM to trailers and to the ground clearance of the guard -- the proposal itself was not changed -- and resubmitted to the Office of the Secretary on September 13, 1991. The notice was submitted to the Office of Management and Budget (OMB) on December 5, 1991, and was cleared by OMB on December 26, 1991. OMB only asked that we add a sentence regarding the relationship of this notice to the conspicuity proposal issued earlier in December.

A copy of the notice is included in the attachment.

QUESTION #9: What objections, if any does OMB have to the proposed rule?

ANSWER: The supplemental NPRM was sent to OMB on December 5, 1991, and cleared on December 26, 1991. OMB did not express any objections to the proposal.

QUESTION #10: Have all reviews been conducted?

ANSWER: Yes. The notice was cleared by OMB on December 26, 1991, and should be published in the Federal Register the week of December 30.

QUESTION #11: When will the final rule be published?

ANSWER: We can not pre-judge the rulemaking process by declaring that we will issue a final rule prior to receiving comments on the supplemental NPRM. If the issuance of a final rule were the appropriate subsequent action, it could be promulgated by the end of calendar year 1992.

QUESTION #12: In NHTSA's Highway Safety Priority Plan, a regulatory decision on rear truck underride was expected to be made by Summer of 1991. What led the agency to believe it would meet this goal.

ANSWER: The agency did meet this goal. It was decided by the agency during the summer that the issuance of a supplemental NPRM was appropriate. That decision was communicated to the public at the agency's quarterly meeting on the status of rulemaking, held in Detroit on August 20, 1991. The transcript of the meeting was placed in a public docket and the relevant pages of that transcript are enclosed for your perusal.

Perhaps the term "regulatory decision" is confusing to the Committee. By this term we mean that the agency will decide whether or not it believes that regulation on a specific subject is appropriate. In this case, we decided it was. However, the term does not necessarily mean that a public notice will be issued by that time because of the need for reviews of our rulemakings outside the agency. In any event, we communicate our internal decisions to the public, usually through these quarterly meetings as was done in this case.

[Information and response to chairwoman Schroeder's Questions, 1 through 7 are retained in committee files.]

U.S. House of Representatives
SELECT COMMITTEE ON
CHILDREN, YOUTH, AND FAMILIES
WASHINGTON, DC 20515-6401

December 18, 1991

The Honorable Jerry R. Curry
Administrator
National Highway Traffic Safety Administration
400 7th Street, S.W.
Washington, D. C. 20590

Dear Mr. Curry:

Following up my letter of December 11, 1991, posing questions concerning seatbelts and truck underride, Representative Clyde C. Holloway, has requested that you respond in writing to the following questions for inclusion in the official record of the hearing held by the Select Committee on December 4, 1991, entitled "Automotive Safety: Is Enough Being Done to Protect America's Families?"

1) How many people were killed in 1990 on our highways? How many of these fatalities were associated with truck underride crashes, tension relievers and automatic belts? Do these areas represent significant safety problems?

2) What are the most significant areas in which this Committee could work to improve highway safety?

3) Your rules require that automobile manufacturers place instructions in the vehicle owner's manual as to the correct use of tension relievers. Do you believe that placing instructions in this document is a viable means of communicating with consumers?

4) What means does the agency use to communicate proper safety belt use to consumers?

5) What is the relationship between vehicle conspicuity and truck underride devices? Will the reflective marking of trucks help to reduce the underride problem?

6) Has the media been helpful in disseminating information on proper belt usage?

7) It is alleged that some automatic belts do not offer protection in certain types of crashes. Are you concerned about that and if so, what are you doing about it?

8) Are automatic belts producing safety benefits?

9) Since tension relievers in belts can result in excessive slack, why are they allowed?

We would appreciate your response to these questions by Monday, December 30, 1991.

Sincerely,

PATRICIA SCHROEDER
Chairwoman
Select Committee on Children,
Youth and Families

Enclosure

U.S. Department of Transportation
National Highway Traffic Safety Administration

Administrator

400 Seventh Street, S.W.
Washington, D.C. 20590

JAN 15 1992

The Honorable Patricia Schroeder
Chairwoman, Select Committee
on Children, Youth, and Families
United States House of Representatives
Washington, D.C. 20515-6401

Dear Madam Chairwoman:

Enclosed are responses to the questions submitted by Representative Holloway. Please let me know if I can be of further assistance.

Sincerely,

Jerry Ralph Curry

Enclosures

Response From Ralph Curry to Questions Posed by Congressman Clyde C. Holloway

Question #11 How many people were killed in 1990 on our highways? How many of these fatalities were associated with underride crashes, tension relievers, and automatic belts? Do these areas represent significant safety problems?

Answer: The detailed fatality numbers for 1990 have not been published as yet. In 1989, there were 33,586 occupants of passenger cars, light trucks,and multipurpose vehicles killed on the highways. There were 133 occupants of cars and light trucks killed in underride collisions with heavy trucks in 1989; 74 of these were killed in side underride collisions and 59 were killed in rear underride collisions. Thus, while even a single death is tragic, rear underride crashes represent a relatively small portion of the highway fatality problem.

We have no indication at this time that automatic belts or tension relievers represent any type of safety problem, let alone a significant one. We believe that these devices encourage restraint usage by persons who otherwise might not be inclined to use restraints. For example, while overall driver belt usage through September 1991 was 51 percent, the usage of automatic belts was 80 percent. This higher belt usage leads to safety benefits, not safety problems.

As mentioned in the answer to Question #8, we are currently conducting a study to determine if some types of automatic restraints are more effective than others.

QUESTION #2: What are the most significant areas in which this Committee could work to improve highway safety?

ANSWER: To most improve highway safety, the Committee could help the agency by impressing upon the public the importance of (1) wearing safety belts (and wearing them correctly), (2) not exceeding the speed limit, (3) having children restrained in approved child safety seats, and (4) not driving while under the influence of alcohol or drugs. By creating and supporting awareness campaigns in these areas, the Committee could help the safety community to provide an immediate safety benefit for large numbers of people. The Committee could also help the agency supplement its vehicle regulatory activities by informing consumers about safety equipment such as air bags, anti-lock brakes, adjustable upper anchorages (which can improve belt fit), etc. Creating a public awareness about available vehicle safety features would encourage manufacturers to include them before they are required to do so.

We have enclosed a copy of NHTSA's Priority Plan, which highlights our views on the most important safety priorities. We would be happy to work with the Committee to determine which of these areas might be most suitable for Committee involvement.

[Book entitled Highway Safety, Priority Plan 1991-1993, from the U.S. Department of Transportation, National Highway Traffic Safety Administration is retained in committee files.]

QUESTION #3.: Your rules require that automobile manufacturers place instructions in the vehicles owner's manual as to the correct use of tension relievers. Do you believe that placing instructions in this document is a viable means of communicating with consumers?

ANSWER: Yes. The owner's manual is the means through which the vehicle manufacturer relates important product information to the consumer. The agency has often also used this means to impart important information to consumers on safety belt use, the placement of child safety seats, utility vehicle handling, and other safety information. We wish to point out that the Congress itself believes that owner's manuals are a viable means of conveying important information to consumers. Section 2508(A)(2) of the recently enacted NHTSA Authorization Act of 1991 requires that owner manuals include statements of the need to wear safety belts in vehicles with air bags and that belts should always be worn by all occupants.

While we would not expect that all vehicle owners read every word of their manual, we think most owners -- or the vehicle's principal driver -- do read the manual. A vehicle is the second-most expensive purchase (next to a home) for most Americans, and the most expensive for many others. Consumers act rationally with regard to expensive purchases and it is rational to read the instructions that come with a car. We would also point out that not all occupants need to read the manual as the actions of the driver (such as wearing a safety belt and wearing it properly) are often copied by other occupants as the driver functions as the "captain" of the vehicle. Thus, we believe that instructions on the proper use of safety belts (i.e., to be worn snugly) being placed in vehicle owner's manuals is a viable means of communicating with consumers. And, as related to the Committee in prior correspondence, the agency also extensively uses other means of conveying safety information to consumers.

QUESTION #4.: What means does the agency use to communicate proper safety belt use to consumers?

ANSWER: As we indicated in our previous response to the Committee, NHTSA encourages correct use of safety belts through publication and distribution of consumer information. We provide this and other information on correct use to the public directly and through health and safety professionals such as physicians and nurses, as well as through state and local government agencies. Agency officials also promote correct safety belt use at every available forum.

For example, our Consumer Information Bulletin on the proper use of safety belts explains that some manufacturers have installed tension relieving devices in the belt systems and provides specific information on how to use them properly. This bulletin is distributed to the public through our Auto Safety Hotline and to consumers who call our offices requesting information on safety belt use. Approximately 5,000 of these bulletins have been distributed to the public over the last three years. This agency's concern on the proper use of safety belts by consumers is carried over in our public service releases that are utilized in newspapers and magazines. The agency works with health and safety professionals by supplying them with information on the proper manner in which to wear safety belts and in particular the proper way to correctly utilize any tension relieving feature.

Copies of the consumer information bulletin, press releases, and the type of reports distributed to health and safety professionals were included in our previous response to the committee.

Also, we require manufacturers that utilize tension relieving devices to place information in the vehicle owner's manual as to the proper operation of the device and the recommended safe amount of slack and "warn that introducing slack beyond the specified amount could significantly reduce the effectiveness of the belt in a crash" (49 CFR 208 S7.4.2).

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QUESTION #5: What is the relationship between vehicle conspicuity and truck underride devices? Will the reflective marking of trucks help reduce the underride problem?

ANSWER: Improvements in conspicuity are aimed toward reducing the number of rear end and side collisions with trucks; underride devices are used to reduce the severity of injuries caused by certain rear end crashes. It is clearly more beneficial to avoid a crash than to reduce its consequences, should it occur. In this regard, conspicuity treatments can eliminate some of the underride crashes. It is expected that the proposed conspicuity treatment will prevent 25% of the rear end crashes that occur at night, resulting in the elimination of 8% of all rear end crashes. It is also expected that 15% of the night time fatal rear end crashes in which the rear of a trailer or semi-trailer is struck will be eliminated.

QUESTION #6: Has the media been helpful in disseminating information on proper belt usage?

ANSWER: The media has been extremely helpful in relaying certain safety messages, particularly those relating to drunk or drugged driving and the need to buckle up. However, when it comes to the specific question of the proper use of tension relievers, even though the agency has provided extensive material to the media on this subject, certain media outlets have chosen instead to highlight the alleged problems with these belts. It is ironic that the same media outlets (particularly major TV networks) that produce shows that claim that consumers are unaware of how to properly wear safety belts with tension relievers, decline to air information that we provide them on that very subject. In general, it is difficult to get instructional information to consumers through the media; we have fared better in reaching consumer groups through state and local governmental safety networks.

QUESTION #7.: It is alleged that some automatic belts do not offer protection in certain types of crashes. Are you concerned about that and if so, what are you doing about it?

ANSWER: NHTSA is aware through communication with the public and its own monitoring activities of concerns expressed regarding the performance of the different types of automatic restraints. The public has raised questions regarding how effective these systems are in preventing ejection, the possibility of receiving injuries from the systems themselves, and other important concerns. As part of the original rulemaking in 1984 requiring automatic restraints, the effectiveness of the different types of automatic systems -- both automatic belts and air bags -- in reducing injury and fatality were estimated.

First, it should be stressed that the fact that the estimated effectiveness of these different systems would be in the range of 35-50% means that, like any safety device, they are not effective in all crash situations. Automatic restraints are not a panacea for all crash consequences and there are situations, such as catastrophic crashes, that are not survivable regardless of the performance of these systems. Second, the original rulemaking recognized that each of the automatic restraints might not be as effective in all types of crashes. Issues were raised at that time that automatic belts might not be as effective as manual belts in preventing ejection. Also, air bags alone would not be effective in side impacts and rollovers and air bags without the use of lap/shoulder belts would offer less protection than lap/shoulder belts alone. Thus, we recognized the need to warn consumers to wear their belts in cars equipped with air bags. Even given these considerations, based on the estimates of the original study, the effectiveness of these systems (35 to 50 percent) was similar to that for manual belts (40 to 50 percent). The decision was made by the Department that the only way to increase the low belt usage rate, which hovered around 10-15 percent in the late 1970's and early 1980's, and to obtain the increased effectiveness of restraints was to implement automatic occupant protection.

The agency, in response to a petition from the Center for Auto Safety, conducted an analysis on automatic door-mounted safety belts to determine if we should pursue an investigation into whether this system was defective. Based on our review of the performance of this system, we concluded that the system was working as designed and there were no data suggesting a defect.

Beyond this determination, the agency is in the process of conducting a comprehensive evaluation of the effectiveness of all types of automatic restraints -- air bags, and the different types of automatic belts. The results of this evaluation should be available in 1992.

QUESTION #8.: Are automatic belts producing safety benefits?

ANSWER: NHTSA is presently evaluating the benefits of automatic restraints -- both automatic belts and air bags -- and a report is being developed which will present the results of this evaluation.

The report is an evaluation of the "real-world" costs and benefits of the agency's 1984 amendments of FMVSS 208. In that report, we plan to develop estimates of the actual effectiveness, in crashes, of the various types of restraint systems manufacturers have used to meet the requirements of the 1984 amendments, as well as an assessment of the costs of these systems. This analysis requires substantial accident data to reach statistically significant conclusions on the level of occupant protection provided by each type of restraint system. We have revised our schedule for the evaluation because there are still not enough cases available to provide results about the effectiveness of automatic belts. We will do further analyses when more 1991 crash data are available. New target dates for a report have not been established, but we hope to complete a report in 1992.

QUESTION #9.: Since tension relievers in belts can result in excessive slack, why are they allowed?

ANSWER: Tension-relieving devices were added by auto manufacturers to help improve the comfort and fit of safety belts and thus increase belt usage. Studies conducted by this agency indicated that two of the primary reasons that people did not wear belts were the incorrect fit and uncomfortable pressure of the belts. The tension-relieving device was introduced by manufacturers to encourage people of different heights and weights to use their safety belts.

The agency also recognized that excessive slack would reduce belt effectiveness. The question then, was, on balance, did tension relievers -- with their propensity to increase belt usage but slightly decrease effectiveness if excessive slack were introduced -- yield net safety benefits to the motoring public?

Because of the myriad factors affecting belt usage, tension relievers could not be convincingly shown to increase usage, (there were some studies which demonstrated higher belt usage). Nevertheless, since tension relievers addressed two of the principal reasons why people did not wear belts, logic would dictate that some immeasurable number of people wore their belts who otherwise would not have. At the same time, NHTSA studies showed that excessive slack was exhibited by less than two (2) percent of belt wearers. At this rate, if tension relievers increased usage by as little as one percentage point, they would yield net safety benefits.

It should be recognized that for any device aimed at improving the fit of safety belts by allowing adjustments by introducing slack, altering the geometry, or other means, there will always be a possibility that consumers may improperly adjust the safety belt. Again, the question is whether the increased usage and greater comfort that may result from the installation of these devices off-set any possible decrease in belt effectiveness because of improper adjustment.

Prepared Statement of American Trucking Associations, Inc., on Oversight Hearing on Rear Underride Guards, Washington, DC

INTRODUCTION

These comments are submitted on behalf of the American Trucking Associations, ATA, the national trade association of the trucking industry and its 4,000 members. Through its 51 affiliated trucking associations located in every state and the District of Columbia, 10 affiliated conferences and their 30,000 motor carrier members, ATA represents every type and class of motor carrier in the country, both for-hire and private; regulated and exempt.

The trucking industry is diverse in nature. There are over 45,000 for-hire motor carriers of property with Interstate Commerce Commission Authority, less than 2,000 of which earn over $1 million in annual revenues. Owner operators and private motor carriers comprise another 167,000 businesses. Most carriers are small; over 95 percent of all motor carriers in this country operate less than six vehicles.

ATA appreciates the opportunity to provide the following statement to the Select Committee on the issue of rear underride guards for trucks.

BACKGROUND

ATA and the trucking industry have a long and established record of commitment to highway safety. For many years, the industry has worked tirelessly to improve the safe operation of vehicles on the nation's highways and to improve safety-related equipment on all commercial vehicles.

ATA and the trucking industry have been strong and early advocates for many safety initiatives both in Congress and at the Department of Transportation. We have fought for and won substantial improvements in numerous truck safety regulations, most notably:

* Creation of a single commercial drivers license;
* Elimination of the commercial zone safety exemption;
* Requirements for mandatory drug and alcohol testing;
* Establishment of the Motor Carrier Safety Assistance Program, including random roadside inspections for driver, vehicle and load safety;
* Banning radar detectors from commercial vehicles;
* Shutting down motor carriers who pose an imminent hazard to highway safety; and
* Maintaining a 55 mph speed limit for trucks.

ATA also has initiated numerous programs for the trucking industry that have helped attain safety objectives, including:

* Training programs for drivers, supervisors, and driving schools;
* Management programs to assure safe vehicles, safe drivers and safe operations;
* Research to reduce accident experience; and
* Cooperative programs to improve vehicle performance, especially in the area of truck braking systems.

These initiatives and other activities to promote and encourage safety are working. In the period of 1977-1987:

* The fatal crash involvement rate for heavy trucks has declined by 40 percent, despite a 16 percent increase in the number of miles driven.
* There has been an 18 percent drop in total fatalities involving medium and heavy duty trucks,
* The number of fatal truck accidents has dropped 17 percent, and
* Five percent fewer trucks and 16 percent fewer drivers were placed out-of-service after the Roadcheck '91 inspection project, than were for a similar nationwide inspection effort in 1990.

The industry is proud of its accomplishments in highway safety, and is working toward continuing improvements in the future.

The Select Committee has requested ATA's participation in this oversight hearing on rear underride guards found on commercial vehicles. A rear underride guard is a device found at the back of

trucks and truck trailers which is designed to reduce the likelihood that striking vehicles will go beneath it, hence the term underride. A diagram of a typical rear underride device is shown in Attachment A.

It is important to note that there is currently a federal motor carrier safety regulation, issued by the U.S. Department of Transportation Federal Highway Administration, Office of Motor Carrier Safety (FHWA/OMC) requiring rear end protection (Title 49 C.F.R. 393.86). The current underride guard requirements were established by the Section of Motor Carrier Safety of the ICC in 1953, and are as follows:

393.86 Rear end protection

"Every motor vehicle, except truck tractors, pole trailers and vehicles engaged in driveaway-towaway operations, the date of manufacture of which is subsequent to December 31, 1952, which is so constructed that the body or the chassis assembly if so constructed without a body has a clearance at the rear end of more than 30 inches from the ground when empty, shall be provided with bumpers or devices serving similar purposes which shall be so constructed and located that:

(a) The clearance between the effective bottom of the bumpers or devices and the ground shall not exceed 30 inches with the vehicle empty;

(b) the maximum distance between the closest points between bumpers, or devices, if more than one is used, shall not exceed 24 inches;

(c) the maximum transverse distance from the widest part of the motor vehicle at the rear to the bumper or device shall not exceed 18 inches;

(d) the bumpers or devices shall be located not more than 24 inches forward of the extreme rear of the vehicles; and

(e) the bumpers or devices shall be substantially constructed

and firmly attached. Motor vehicles constructed and maintained so that the body, chassis or other parts of the vehicle afford the rear end protection contemplated shall be deemed to be in compliance with this section. "

Since its inception in the 1950's, when rear end protection was incorporated in the Federal Motor Carrier Safety Regulations, ATA has supported a system to prevent and reduce the severity of accidents involving underride. As a result of industry pressure and demands, most equipment manufactured today incorporates underride guards which have features that go beyond the minimum specifications in 49 C.F.R. 393.86.

Cost/Benefit Factors Involving Rear Underride Protection

According to statistics of the U.S. DOT, rear end underride accidents result in around 60 deaths each year. Although everyone in the trucking industry would like to see that number be reduced to zero, in many cases, colliding vehicle speed was so high that death could not have been prevented by any device or guard.

Comparatively, according to the National Transportation Safety Board, in calendar year 1990, there were 5,432 accidents resulting in 607 fatalities from trains striking cars at grade crossings. There are also around 3000 motor vehicle fatalities each year resulting from impact with trees. There are more fatalities from lightning, hunting, bicycling and swimming than from underride. Attachment B lists fatality rates for a variety of common products and activities.

In evaluating underride protective devices, it is important to

consider whether injury and death can be reduced from some mandated change in technology. Since underride is an incident of low frequency, care must be taken to assure that countermeasures do not themselves create a hazard. For example, further lowering a guard could cause the truck or the trailer to drag, hang up or get caught on dips and grade divided crossings, thereby stalling the truck and subjecting both it and the driver to impact from oncoming traffic or trains at rail crossings.

Regulatory Efforts Relating to Rear Underride

While the guard mandated by today's federal motor carrier safety regulation has generally been adequate, numerous efforts conducted by DOT over the past 24 years, including testing and studies costing millions of dollars, indicate that it can be improved. As regulatory changes have been proposed over the years, ATA has consistently supported improvements for rear underride protection.

In October 1967, NHTSA proposed a new Federal Motor Vehicle Safety Standard which required improved underride protection on all new vehicles. The first docket to create the new guard was debated via the public comment mechanism and an amended proposal was published in August, 1970.

After further public comment, NHTSA terminated the proposed rulemaking because:

> "... the Administration has concluded that, at the present time, the safety benefits achievable in terms of

lives and injuries saved would not be commensurate with the cost of implementing the proposed requirements." (see Attachment D)

In August of 1977, acting on a petition from the Insurance Institute for Highway Safety (IIHS), the Bureau of Motor Carrier Safety of FHWA (now the Office of Motor Carriers, (OMC)) and NHTSA jointly initiated a program to explore underride guard improvements. The focus of the NHTSA/OMC research was on the guard that provided the best overall protection for the vehicle occupants, not the one which necessarily best stopped underride itself.

Designing the optimum rear underride protection is far from a simple matter. There are tradeoffs between guard strength, underride penetration, and the forces of the accident transmitted to car occupants that were never systematically analyzed until this investigation. To conduct this work, NHTSA/OMC used an underride crash and risk analysis model, (UCAM).

This work proved that it is best to have a yielding guard; one which deforms when struck, rather than one which is constructed to standards that render it virtually unyielding and impenetrable.

The theory behind a collapsible underride guard is fairly simple. During a rear end crash, energy from the striking vehicle is expended on the collapse and deformation of the underride guard rather than on the deformation of the striking vehicle. Whereas an unyielding barrier will prevent underride but cause death. It was found that systems with some "give" will help save lives.

When all was said and done, NHTSA used the output of these

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studies, conditioned by a European Economic Community (EEC) Directive and Swedish regulations to publish the 1981 notice of proposed rulemaking. This is the proposed standard that ATA accepted in 1986, in a letter to the Federal Highway Administration. (Attachment C)

ATA supported NHTSA's approach to establish a strength performance factor for the guard to specify its structural specifications and performance upon impacts from striking vehicles, and more stringent dimensional requirements. However, we did not believe that a guard alone would have much effect on the underride problem as, using the most optimistic data available on number of lives saved, the 1981 proposal afforded no greater benefit than the one NHTSA terminated in 1971. Because of that, we also felt that some effort should be focused on preventing the cause of rear underride accidents in the first place rather than only trying to mitigate what is essentially a fatal encounter above 35 mph.[1]

Therefore, ATA concluded that enhanced underride protection alone would not afford a completely satisfactory countermeasure. (Subsequently the industry and DOT have conducted substantial research in the area of conspicuity; making trucks more visible to motorists from the rear and sides.)

In terms of the cost of implementing rear underride protection in accordance with NHTSA's 1981 docket, we estimated an annual cost of $250,000,000 for full compliance with the then-proposed NHTSA

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[1] Federal Motor Vehicle Safety Standards are directed at making barrier collision accidents survivable at speeds of 35 mph or less.

rule. NHTSA had estimated that the proposed rule terminated for not being cost beneficial in 1971 would cost $500,000,000 annually. (see Attachment E)

Recent underride activities include statements by NHTSA that the agency will soon publish proposed rulemaking involving both conspicuity and underride. Also, a further study of rear underride is called for in the just passed Surface Transportation Reauthorization Act which has been sent to the President for signature into law.

Potential Alternative Technologies

Mention has been made from time to time of using a "shock" (energy) absorbing guard which is reported to be in service on some European vehicles as a potential option to help improve rear underride protection. Instead of collapsing, such guards use springs or similar technology to absorb the energy of impact. The 1981 NHTSA proposal incorporated aspects of the EEC and Swedish rules which govern this area and in fact, NHTSA concluded that the moderate strength guard proposed was "reasonably comparable to the energy absorbing guard." It is important to note that this comparability was achieved without the additional weight, inspection and maintenance problems, and possibility of malfunction associated with this alternative shock (energy) absorbing guard.

After the industry commented on NHTSA's 1981 Notice of Proposed Rulemaking for underride, it began the traditional process

of awaiting the publication of a final rule. As it became apparent that a final rule was not forthcoming, and upon being asked for its position by the Federal Highway Administrator, in June 1986 ATA went on record with FHWA supporting revisions to the federal underride standards, stating in a letter to FHWA that we would accept proposals for both lowering the guard (to 22") and specifying appropriate strength requirements. (Attachment C)

During those years and even now, the industry is adopting underride protection similar to NHTSA's 1981 proposal, and it is doing so without a new regulation.

Industry Initiatives

As a result of the industry's concern for safety and rear underride prevention, ATA has been an advocate of DOT activity in the area of making vehicles more easily seen; otherwise known as conspicuity. Through the ATA Foundation's Trucking Research Institute, we have initiated research in conjunction with industry insurers and our members, we have been active participants in reflective material standards setting committees at the Society of Automotive Engineers, and are supporting conspicuity evaluations with DOT.

Conspicuity is of particular significance. There are numerous reports of underride incidents which have occurred at car speeds above 50 mph with no evidence of skid marks at the accident scene, particularly at night or in certain weather conditions. This is an indication that because of alcohol or drug intoxication, fatigue,

or inattention for some other reason, the passenger car driver either did not see or selected to run into (suicide) the truck which was about to be struck. In these instances, it is likely that no amount of underride protection would improve survivability of the crash, but in certain cases, some conspicuity enhancement might help completely avoid the incident.

Because approximately two-thirds of all rear underride accidents occur at night, the American Trucking Associations Foundation's Trucking Research Institute is currently conducting research to evaluate the effectiveness of various conspicuity treatments on the incidence of side and rear underride on truck trailers. This evaluation includes different reflective materials and patterns on the rear and side of trailers under different operational conditions.

Preliminary results from this study suggest that some conspicuity enhancements have positive effects on reducing the incidence of accidents related to striking trailers along the sides of roads under certain time and weather conditions. Of the 13 fleets and several thousand trailers which have been treated with reflective materials thus far in the study, from the period 1987 to 1989, a reported 0.12 "T-bone" conspicuity-related accidents (an accident in which a vehicle strikes the side of a trailer) per million vehicle miles traveled was observed. Similar data is not yet available on the effectiveness of conspicuity treatments on the incidence of rear underride. It is important to note that these specific data and conclusions for side underride are not

necessarily transferrable to rear underride, although it is possible that the same trends may be observed.

Based on projected data for 1991, there are an expected 1.8 "T-bone" accidents per million miles for the study fleet. To date however, there have been no conspicuity related accidents reported thus far in the study sample using conspicuity treatments. Work continues on defining the optimum reflective materials, applications and use. We believe that this work in conspicuity will provide useful information and a better understanding of the causes and potential preventive measures of some underride accidents.

In addition, the industry has initiated it's own standard and recommended practice for rear underride dimensions. The Maintenance Council (TMC) of ATA published a recommended practice (RP) in 1988 which established a 22" height for the rear bumpers of general freight equipment (Attachment A). This practice does not have strength requirements, but is dimensionally similar to the 1981 NHTSA underride proposal. This recommended practice has served notice on the manufacturers of trucking equipment that a 22" height is the standard.

This RP was developed as part of a move in the shipper community to the use of devices known as dock locks. These devices "grab" the rear of underride guards and securely hold trailers to prevent any inadvertent movement and the possibility that the trailer might pull away from the dock while being loaded or unloaded. Obviously movement away from the dock opens a gap which

people can fall through. Dock locks help assure compliance with standards of the Occupational Safety and Health Administration (OSHA), to prevent such openings and, thereby, promote safety during the loading and unloading of trailers by either forklifts or hand carrying freight.

To work on all equipment, the dock lock must be designed to fit within a universally accepted latching envelope. The industry sponsored TMC RP defines that envelope. While many dimensions could have been used in establishing that target, the conditions and restraints set by the 1981 NHTSA proposal were used out of a concern for reducing underride.

CONCLUSIONS

The trucking industry has been a strong supporter, advocate and leader of many safety initiatives involving vehicles, equipment and drivers. The 7.8 million men and women employed by the trucking industry are committed to highway safety.

We have supported efforts to improve current rear underride protection as noted in the previous comments. Because of the industry's work in promoting the Recommended Practice of The Maintenance Council of ATA, we believe there is a general trend toward implementation of the 1981 NHTSA proposal, and we believe that many motor carriers in the industry are purchasing trailers built with guards that reflect the requirements in the 1981 proposal.

In conclusion, we believe that work on assuring that drivers can see trucks (conspicuity) is a very important part of underride control as a preventive measure; and, we are conducting research in that area. Further efforts to research rear underride protection itself are included in the recently passed Surface Transportation Reauthorization Act now awaiting the President's signature into law.

ATA and the trucking industry are committed to highway safety and appreciate the opportunity to provide this statement for the Select Committee, and would be pleased to respond to any further inquiries or questions.

/attachments

ATTACHMENT A

Recommended Practice

RP 707 VMRS 78-009

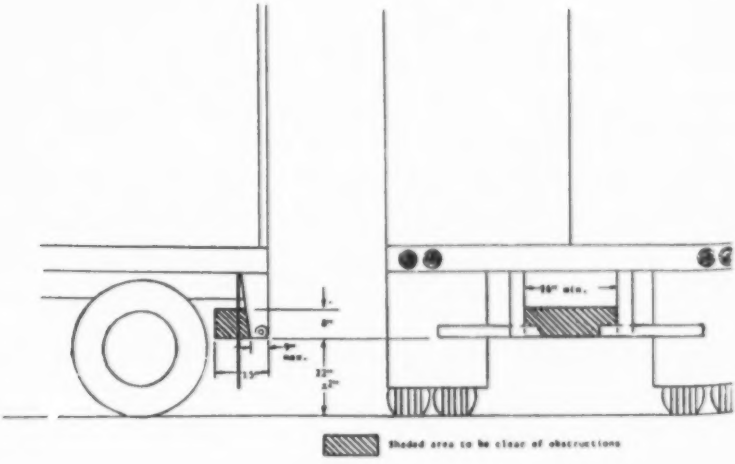
ICC BUMPER DIMENSIONS

PREFACE
The following Recommended Practice is subject to the Disclaimer at the front of this manual. Users are urged to read the Disclaimer before considering adoption of any portion of this Recommended Practice.

PURPOSE
This Recommended Practice was prepared to standardize ICC Bumper Dimensions.

SCOPE
For all trailers required to operate with ICC bumpers in service where the use of dock locking devices is anticipated.

NOTE
Dimensions shown on following drawing.



ATTACHMENT B

ANNUAL FATALITIES

All Causes, 1982	1,974,797
All Accidents, 1982	94,082
Motor Vehicles, 1982	43,721
Suicide, 1982	28,242
Homicide, 1982	22,073
Home Living, 1982	21,000
Falls, 1982	12,077
Drowning, 1982	6,427
Fires, Burns, 1982	5,210
Poisoning, 1982	3,474
Swimming, 1982	2,522
Construction, 1982	2,100
General Aviation, 1982	1,183
Bicycling, 1982	864
Mining, 1982	600
Hunting, 1980	290
Lightning, 1982	100
Flying Scheduled Domestic Airline, annual avg. for 1980-1982	78
Scuba Diving, 1982	66
Travelling in School Bus, 1982	65
Operating Forklift, annual avg. for 1980-1986	47
Skydiving (Jump and Flight), 1982 (Jump Only)	41 (29)
Skiing, annual avg. for 1978/79-1980/81	37
Football Games (High School and College), 1982	7

Note: Fatalities for forklift operators based on data from California Division of Labor Statistics and Research (Cal DLSR) Supplementary Data System (SDS).

FATAL/7

ANNUAL FATALITIES FOR SOME COMMON PRODUCTS

Beds	684
Ovens and Ranges	282
Gasoline	276
Windows and Window Glass	238
Chairs	193
Bedding	155
Hot Water	126
Plastic Bags	117
Pipes (excluding smoking pipes)	114
Sofas/Couches	92
Garden Tractors	78
Toilets	56
Operating Forklift	47
Lawn Mowers, Power and Unspecified	43
Refrigerators/Freezers	38
Drills, Power and Not Specified	34
Hairdryers	29
Balloons (toy)	22
Swings and Swing Sets	22
Telephones	9
Sleeping Bags	2

Notes:

- All estimates are for 1982, except for forklifts which are an annual average for 1980-1988.
- Fatalities for forklift operators based on data from California Division of Labor Statistics and Research (Cal DLSR) Supplementary Data System (SDS).
- Figures rounded after calculation.

COMMONP/1

National Transportation Safety Board

Washington D.C. 20594

Safety Information

FOR IMMEDIATE RELEASE: WEDNESDAY, JUNE 24, 1981

SEVEN PERCENT OF HIGHWAY FATALITIES INVOLVE CRASHES INTO ROADSIDE TREES

81-47/2815B

More than 7 percent of the nation's motor vehicle fatalities involve impact with roadside trees, and the number of fatal accidents is increasing, the National Transportation Safety Board reported today.

Its review of accident data showed that the six New England states were among the seven states with the highest percentages of fatal crashes into trees as compared to total fatal motor vehicle accidents.

The Safety Board also found that fatal crashes into trees can occur at impact speeds as low as 15 mph when occupants are unrestrained. The average speed at which unrestrained occupants were killed was just over 31 mph.

The Board's review included data from its own investigation of 19 accidents as well as data obtained from several states and the National Highway Traffic Safety Administration.

The typical accident involved a car leaving the road at a curve during the night on a rural, undivided, two-lane asphalt road, the Board said. It recommended that the Federal Highway Administration develop demonstration projects which evaluate improved use of signs, pavement markings and reflectorized delineators that show roadway direction -- particularly at curves on county roads. The Board said this could show "the potential of reducing the number and severity of accidents with trees."

The Board also urged the National League of Cities, the National Association of Towns and Township Officials, and the National Association of Counties to "encourage the development of local programs" to reduce the number of accidents involving motorists striking roadside trees.

Last year there were slightly more than 44,000 motor vehicle fatalities, excluding pedestrians. In a typical year, the Board said, some 3,280 people are killed in 2,900 accidents in which their vehicle strikes a tree.

Single copies of the Safety Board's printed report, "Motor Vehicle Collisions With Trees Along Highways, Roads, and Streets: An Assessment," may be obtained without charge by writing to the Publications Branch, National Transportation Safety Board, Washington, D.C. 20594. Multiple copies may be purchased by mail from the National Technical Information Service, U.S. Department of Commerce, Springfield, Virginia 22161.

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Contact: Brad Dunbar
(202) 382-6605

NTSB Urges Action to Make Trains More Visible at Night

The National Transportation Safety Board has asked for government-industry research and initial federal regulatory action to make U.S. railroad cars and locomotives more visible to motorists at night at rail-highway crossings.

The board said more visible railroad equipment could save a third of the lives now lost in nighttime grade crossing accidents in which a motor vehicle strikes a train. The board cited research by the Federal Railroad Administration showing that addin reflective markings to the sides o railroad cars and locomotives coul save 48 of the 140 lives lost each yea in nighttime accidents in which vehi cles strike trains at grade crossings The FRA has yet to act on its find ings.

The board said accident statistic show there are seven times as man highway vehicles hitting trains a grade crossings at night as in daylight Only 20% of these accidents involve inclement weather, and only 7.3 were cases in which the weathe would have affected reflector effec tiveness. Accident data also show tha various warning systems were in plac at more than 90% of all the crossing where the accidents occurred.

Grade separation, "the ideal solu tion" to the grade crossing acciden problem, is too expensive to be feas ible on a large scale, the safety boar said. Flashing lights and gates are ar other solution but, according to th board, are "expensive and not full effective." Most crossings hav neither lights nor gates.

The NTSB cited unpublished re search conducted recently by th FRA which the board said clear shows that reflectorization is a cos beneficial solution. The board sa reflectors on trains would save 48 lives at an estimated cost of $58 mi lion over 10 years, compared with th Department of Transportation's est mate of 276 lives saved at a cost of $ billion for active crossing signals an for signs and pavement markings.

The safety board recommende that the FRA begin rulemaking wit in six months seeking "the improve ment of nighttime train car and loc motive visibility at grade crossings emphasizing the benefits of reflecti devices or materials on the sides train cars and locomotives.

It also recommended that the FR cooperate with the Federal Highw Administration, the National Con mittee on Uniform Traffic Contr Devices, and the Association American Railroads in research cri ria for use of such devices or mat rials in either mandatory or volunta programs.

Single copies of the NTSB's print report, "Safety Effectiveness Evalu tion — The Improvement of Nigh time Conspicuity of Railroad Trains, may be obtained without charge b writing to the Publications Branc National Transportation Safe Board, Washington, D.C. 2059 Multiple copies may be purchas from the National Technical Inform tion Service, U.S. Department Commerce, Springfield, Va. 22161

BEST COPY AVAILABLE

ATTACHMENT C

AMERICAN TRUCKING ASSOCIATIONS, INC.

THOMAS J. DONOHUE
PRESIDENT AND
CHIEF EXECUTIVE OFFICER

2200 MILL ROAD
ALEXANDRIA, VIRGINIA 22314
(703) 838-1000

June 20, 1986

Mr. Ray A. Barnhart
Federal Highway Administration
U.S. Department of Transportation
400 Seventh Street, S.W., Room 4218
Washington, D.C. 20590

Dear Ray:

I understand, from Lana Batts, that you discussed at the National Motor Carrier Advisory Committee possibly revising the requirement for rear end protection, Section 393.86 of the Federal Motor Carrier Safety Regulations. ATA has long held that an effective and practical rear end guard could be achieved by adding an appropriate strength requirement to FMCSR Section 393.86.

However, ATA has also held that any changes must be cost-effective. So far, no proposal has met that criteria. For example, in the January 8, 1981, Federal Register it was noted that DOT has determined the 1971 rulemaking was terminated after "...the agency concluded that the safety benefits achievable with the particular type of underride guard then contemplated would not be commensurate with the cost of implementing the standard."

Minor changes of the present regulation are all that is necessary. Since ATA's last formal comments to the Rear Underride Protection Docket in April of 1981, it has become inescapable that automobile height has been reduced. Hence, the 30 inch maximum currently specified in the regulation is probably excessive. ATA would support proposals for both lowering the height of the guard and specifying appropriate strength requirements. A loaded trailer height of 22 inches is something which carriers have

477:

determined will prove adequate to clear highway obstructions at grade transitions and for special activities like piggyback operations. Severe strength is unnecessary. The strength requirements must compromise between the guards' rigidity and flexibility. Too rigid a guard would prevent underride but create a "brick wall" which would kill impacting motorists. Excessive flexibility will result in a guard that allows severe underride. Deflections in the range of 18 inches appear adequate.

One aspect of the current Section 393.86 which ATA would like retained is the provision that compliance is met if the body, chassis, or other parts of the vehicle (including tires) afford the rear end protection contemplated by Section 393.86.

ATA has participated in each DOT rulemaking docket concerning underride. I have a great interest in this topic and a wide knowledge about it. Please call if I can be of help as you study the issue.

Sincerely,

Thomas J. Donohue

/mc

ATTACHMENT D

National Highway Traffic Safety Administration

[49 CFR Part 571]

[Docket No. 1-11; Notice 6]

REAR UNDERRIDE PROTECTION

Notices proposing a motor vehicle safety standard on rear underride protection, applicable to trucks and trailers, were published October 14, 1967 (32 F.R. 14278), March 19, 1969 (34 F.R. 5383), and August 14, 1970 (35 F.R. 12966). Based upon the information received in response to the notices and evaluations of cost and accident data, the Administration has concluded that, at the present time, the safety benefits achievable in terms of lives and injuries saved would not be commensurate with the cost of implementing the proposed requirements. For the information of all interested persons, notice is hereby given that the rulemaking action is terminated, and that no final rule will be issued on this subject without further notice of proposed rulemaking.

This notice is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1392, 1407) and the delegations of authority at 49 CFR 1.51 and 49 CFR 501.8.

Issued on June 15, 1971.

ROBERT L. CARTER,
Acting Associate Administrator,
Motor Vehicle Programs.

[FR Doc.71-8948 Filed 6-17-71;8:53 am]

ATTACHMENT E

BEFORE THE
DEPARTMENT OF TRANSPORTATION

NATIONAL HIGHWAY TRAFFIC SAFETY
ADMINISTRATION

DOCKET NO. 1-11; NOTICE 8
FEDERAL MOTOR VEHICLE SAFETY STANDARDS;
REAR UNDERRIDE PROTECTION

49 C.F.R. PART 571

COMMENTS OF AMERICAN TRUCKING ASSOCIATIONS, Inc.

Nelson J. Cooney
General Counsel
Alan J. Thiemann
Attorney

Larry W. Strawhorn
Director
Victor A. Suski
Automotive Engineer
Engineering Department

1616 P Street, N.W.
Washington, D.C. 20036

Date: April 8, 1981

BEFORE THE
DEPARTMENT OF TRANSPORTATION

NATIONAL HIGHWAY TRAFFIC SAFETY
ADMINISTRATION

DOCKET NO. 1-11; NOTICE 8
FEDERAL MOTOR VEHICLE SAFETY STANDARDS;
REAR UNDERRIDE PROTECTION

49 C.F.R. PART 571

COMMENTS OF AMERICAN
TRUCKING ASSOCIATIONS, Inc.

Comes now American Trucking Associations, Inc. (ATA), and files these comments in response to the notice of proposed rulemaking published in the Federal Register on January 8, 1981 (46 Fed. Reg. 2136). NHTSA has invited public comment on the proposed performance standard for underride protective devices on most trucks and trailers having a gross vehicle weight rating greater than 10,000 pounds. Comments are due April 8, 1981.

ATA is the national organization of the trucking industry, representing all types of motor carriers of property, both for-hire and private, on whose behalf it customarily appears in proceedings before the Department of Transportation, the Interstate Commerce Commission and the courts. It is a non-stock, non-profit corporation organized and existing under the laws of the District of Columbia, with offices at 1616 P Street, Northwest, Washington, D.C. 20036.

As the national representative of the trucking industry, ATA is interested in safety standards and regulations which will affect the quality and performance of equipment utilized by motor carriers. ATA has participated in numerous proceedings before NHTSA involving the formulation and promulgation of motor vehicle safety standards applicable to motor carrier equipment, including earlier efforts in Docket No. 1-11. Consequently, we urge that the attached comments of our Engineering Department be given considerable weight in finalizing action in this proceeding.

Respectfully submitted,

AMERICAN TRUCKING ASSOCIATIONS, INC.

Nelson J. Cooney
General Counsel .

Alan J. Thiemann
Attorney

Attachment

Comments of the ATA Engineering Department

In earlier filings to Docket 1-11, filed in November, 1977 and October, 1970, ATA stated that FMCSR 393.86 provided a starting point from which an acceptable regulation providing improved underride protection could be developed. ATA's position since 1970 has been that an effective and practical guard system could be developed by amending 393.86 to include a strength factor with more stringent dimensional requirements. Except for some requirements to limit deflection of the guard (discussed herein), no evidence has been presented to warrant any change in our position. We are gratified to find that, from an engineering standpoint, the proposals in this docket are essentially consistent with our long-held view. Inasmuch as the proposed FMVSS would apply only to new equipment, we could support it, were it not for several unresolved shortcomings of an economic nature.

ATA voiced several reservations in its 1977 filing that went beyond the mere performance aspects of an underride guard:

1) accident data on car into truck rear end occurrences were inadequate to support rulemaking;

2) guards would be ineffective in impacts above 35 mph;

3) insufficient attention was being given to the strength and shock absorbing qualities of passenger car structures.

Despite diligent and professional research conducted by NHTSA, no data has been developed to eliminate these reservations.

Indeed, other concerns must be raised in addition to the previous ones

4) benefits will not be commensurate with costs (the same expenditures would provide greater safety benefits if applied to other areas); and

5) industry will bear the brunt of a future conspicuity enhancement rule in addition to rear underride protection, further increasing costs over benefits.

We will attempt to discuss these new problems in the following two sections and respond to specific questions asked in the Notice of Proposed Rulemaking.

I. CURRENT UNDERRIDE ACCIDENT DATA DEMONSTRATE THAT COSTS OF THE PROPOSED STANDARD ARE NOT JUSTIFIED BY THE BENEFITS

In attempting to determine approximately how many fatalities occur from underride, we have used the data from Partyka[1], which indicates that 29 occupants of cars were killed in rear-end collisions with heavy trucks in 1978. These fatalities occurred in 25 collisions in which the striking auto underrode the truck to an excessive degree, compared to 288 fatalities resulting from impact forces, not underride. A number of these fatalities from underride are suspect because FARS does not explicitly code underride occurrences.[2] However, Partyka estimated the number of lives saved from the adoption of improved underride guards to be 29 to 58, using a factor of 2 to account for alleged BMCS underreporting. As a result of this statistical manipulation,

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1 Partyka, Susan, "An Analysis of Available Data for Car to Heavy Truck Accidents and the Underride Problem," National Center for Statistics Analysis Research and Development, National Highway Traffic Safety Administration, June 1979.

2 "HSRI Research Review--Collisions of Cars with Tractor-Semitrailers," Michael S. Kubacki, Nov.-Dec. 1979, Vol. 10 No. 3.

the anticipated saving of 60 lives per year stated in the NPRM could actually be as low as 29. In comparison, during 1978 there were 1,263 fatalities resulting from cars striking other cars from the rear.[3]

As noted in the NPRM, in 1971, NHTSA terminated its rulemaking efforts when it was estimated that it would cost $500,000,000 to save 50-100 lives. Comparing 1971 to 1984 (the first full year of implementing of the proposed rule), ATA submits that the costs of the proposal are as disproportionate today as they were in 1971. Our 1984 cost calculation is attached as Attachment I.

	1971	1984
LIVES SAVED	50-100	29-58
ANNUAL COST	$500,000,000	$250,000,000

Although ATA notes that the NPRM makes no designation of this standard under the Regulatory Flexibility Act, the Department of Tranportation's semi-annual summary of regulations shows this proceeding as "nonsignificant." 46 Fed. Reg. 20036 (April 2, 1981). On the basis of our calculation of first-year costs of $250,000,000, ATA submits that this rulemaking is a major regulatory action for purposes of the Regulatory Flexibility Act and E.O. 12291, 46 Fed. Reg. 13193 (February 19, 1981). We hereby formally take issue with the prior determination and request NHTSA to change it designation in accordance with our calculation. Further, we must request that NHTSA make available

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3 Docket 81-02, Center High Mounted Stoplamps for Passenger Cars.

within a reasonable time a full and complete regulatory impact analysis and otherwise comply fully with E.O. 12291.

II. OTHER ACCIDENT COUNTERMEASURES WOULD HAVE MORE BENEFICIAL EFFECTS THAN THE UNDERRIDE PROPOSAL

If conspicuity enhancement measures are ultimately added to the trucks/trailers, the cost for underride protection/prevention would approach $320,000,000 for the first year.[4] ATA submits that an investment of this magnitude would be better employed in more productive safety areas. For example, over half the drivers colliding with truck/trailer rear ends were under the influence of alcohol or drugs or were asleep.[5] The large costs we estimate would eventually become costs to society through increased freight rates, would, if applied to enforcement activities geared at removing impaired drivers from the highway, save thousands of lives. The 55 mph speed limit has saved 40,000 to 50,000 lives since 1974 without motor vehicle owners having to purchase any hardware at all. NHTSA is far more aware than we are of the very substantial impact which a quarter of a billion dollar investment could have on traffic safety, if spent in these more productive areas.

We strongly urge that the Administration seek to eliminate car into truck rear end collisions, rather than attempt to ameliorate the effects of the collision once it happens. Underride guards have been shown by all research conducted, to be ineffective

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[4] This figure is arrived at by adding $200 per vehicle cost of conspicuity enhancement (reported in Notice of Proposed Rulemaking) for 356,700 trucks/trailers to the estimated $250,000,000 annual cost of the underride guard.

[5] "Truck Conspicuity Evaluation," Yellow Freight Systems, Inc., Oct. 1, 1980.

above 35 mph. Thus, DOT's own studies support the view that efforts should be directed to accident prevention.[6, 7]

NHTSA is currently conducting a conspicuity study which should define drivers' needs for visual cues and the effectiveness of various approaches to make trucks and truck trailers more conspicuous. Since this study appears to be well designed, the data obtained should be of assistance in determining the value, in terms of lives saved, of enhanced truck and truck trailer conspicuity. Therefore, ATA suggests that final consideration of underride protection be deferred until results of the conspicuity study are known and the cost effectiveness of that approach can be determined.

Underride protection is a extremely difficult problem to s satisfactorily. Although excessive underride may be fatal, so may impact with a device that inhibits underride, which results in an impact similar to crashing into a "brick wall." NHTSA itself focuses in the NPRM on that range between no and total underride when such intrusion that does occur enhances the likelihood of survival. This is a chancy business at best.

One reason the problem is so intractable is that all the attention has focused on doing something to the truck and/or trailer. The automobile has been totally neglected. The problem would not be so unmanageable, in engineering terms at any rate, if some attention were directed toward modifying auto front ends

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[6] Partyka, Susan, supra n. 1.

[7] Buth, Eugene and Hirsch, T.J., et al., "Performance Upgrading of Commercial Vehicle Rear Underride Guards," Texas A & M Research Foundation, Texas Transportation Institute, Texas A & M University, Sept. 1980.

to incorporate bumpers high enough to engage existing underride guards and increased energy absorbing structures. There is the possibility here for even more safety payoff when cars strike things other than the rear of trucks. While we are not suggesting that all emphasis be placed upon design of the striking vehicle, it must not be completely overlooked.

We respectfully suggest that NHTSA seek out the root causes of traffic fatalities. It will find these in the behavior of the drivers. In one study 34.8% of those colliding with the rear of a trailer had been drinking.[8] In analyzing nine months of operation in 1980, Yellow Freight Systems determined that where the rear of their trailers were struck, 27% of the offending drivers had been drinking, 10% were under the influence of drugs, and 16% had been asleep at the wheel.[9]

The NHTSA approach of attempting to "idiot proof" the design and operation of equipment to compensate for irresponsible drivers has met with increasing diminishing safety returns. The fatality rate in traffic accidents increased 31% in 1979 over 1978 and traffic deaths were expected to increase 15% in 1980 over 1979.[10]

III. RESPONSE TO SPECIFIC QUESTIONS

ATA offers the following responses to the specific questions in the NPRM:

1. Hinged guards (or any energy absorbing guard) would appear to be uneconomical because of a very high initial

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8 Supra, n. 2.

9 Supra, n. 5.

10 Fatal Accident Reporting System Fifth Annual Report.

cost, maintenance burden (replenishment of fluids or replacement of crushable members, if damaged by impact with fixed objects or if impacted by vehicles rear ending the truck or trailer), and replacement cost if damaged beyond repair. Operationally, questions regarding jamming by ice or debris, or freezing of the mechanical elements of a hinged absorber must also be addressed in evaluating hinged guards.

2. Many city pick-up and delivery trucks, and some 40-45 foot vans have hydraulic tailgates. The majority are held by arms which straddle the existing underride guard. Requiring a guard to extend across the rear of the trailer, as proposed in the NPRM, will necessitate redesign of such equipment. A few tailgates are attached at the extreme sides of the truck allowing an underride guard to extend across its rear.

3. Generally, ATA is not conversant with the detail problems small manufacturers face. We would note, however, that the economies of scale and the need for expensive engineering time to be amortized over fewer units will result in guards produced by small manufacturers costing the trucking industry considerably more than those produced by the larger manufacturers. These costs may put many small manufacturers in a non-competitive position. The trucking industry does not wish to see these companies placed in a difficult situation.

4. ATA has no ability to comment regarding lead time.

IV. CONCLUSION

ATA strongly recommends further study of the effectiveness of increased conspicuity before final rulemaking on underride. We have recommended specification of strength and deflection requirements in BMCS regulation 393.86 if a cost beneficial need is shown for such changes. While we conclude that this proposal will essentially do that, we do not support it because:

1) the data on which the proposed rule is based have not been validated;

2) even using NHTSA's figure of lives saved, the benefits of the proposed rule are not commensurate with the costs to society;

3) alternative safety uses for society's investment in underride guards need to be explored to determine where the greater benefit will accrue; and

4) a more productive approach would attempt to prevent rear-end collisions rather than try to mitigate the effects of the impact.

Respectfully submitted,

Engineering Department

Larry W. Strawhorn
Director

Victor A. Suski
Automotive Engineer

ATTACHMENT 1

Cost Impact on Trucking Industry

In order to estimate the cost impact, we must first have a reasonable estimate of the weight of an improved underride guard. Review of several reports indicates that the NHTSA estimate of 100 pounds is reasonable, although some devices could weigh as much as 200 pounds. Next, an estimate of the number of trucks and trailers affected by the rule is necessary. We accept the assertion of Taylor and Ludke[11] that there will be 178,700 trucks affected in 1984 (the first full year of operation under the proposed rule) and TTMA's estimate that 178,000 trailers will be shipped that year.[12] This gives us a total of 356,700 vehicles affected. The final need for this analysis is an estimate of the unit cost of the guards in 1984. Using 1980 prices such estimates range from the $85 in the NPRM to $200 using $2 per pound of steel, while annual operating costs are taken as $5 per pound of added weight.[13] Determination of improved guard costs and weight are shown as follows:

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11 Taylor, Theodore, Jr. and Ludke, Norman F., "Design and Cost Analysis of Truck/Trailer Rear Underride Guards," Corporate Tech. Planning, Inc., March 1980.

12 "Outlook for Trailer Demand 1979-1984," Truck Trailer Manufacturers' Association, August 6, 1979.

13 Buth, Eugene, et al., "Performance Upgrading of Commercial Vehicle Rear Underride Guards," Texas Transportation Institute, September 1980.

Characteristic	Improved Guard	Current[14] Guard	Increment Over Existing Guard
Cost, 1980	$100-200	$ 23.00	$127.00
Weight, lbs.	100	41.5	58.5
Operating Costs	$500/yr.	$207.59	$292.50

Using 10% per year inflation gives a 1984 unit cost of $185.90 and $428.24 operating cost.

The total cost to the industry is made up of:

1. Initial cost and interest (over existing guard);
2. Increased fuel consumption due to added weight;
3. Loss of revenue due to cargo displaced by weight;
4. Increased operating costs.

For 1: Initial cost to equip trucks = 178,700 x $186 = $33,238,200

Initial cost to equip trailers = 178,000 x $186 = 33,108,000

Total 66,346,200

Plus Interest @ 15%/yr. for first yr. 9,951,930

TOTAL INITIAL COST $76,298,130

For 2: Increased fuel consumption, based on Murphy,[15] and fuel at $2.446/gal.[16]

gpm = .00000093 x GCW = .00000093 x 58.5

= .000053 gpm x $2.446/gal.

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14 "Alternate Approaches for Truck Underride Guard Protection," Pioneer Engineering & Manufacturing Company, Corporate Tech. Planning, Inc., October 1980.

15 Murphy, R.W., "Improvement in Fuel Economy and Productivity Through Use of Lightweight Components in Heavy Duty Highway Trucks," Proceedings of the First International Auto. Fuel Economy Research Con., Washington, D.C., 10/31-11/2, 1979.

16 Regina T. Selva and Roger W. Kolins, "The Impact of Gross Vehicle Weights Line Haul Trucking Costs: 1981 and 1985," Issues in Truck Sizes, Weights, Technical Report TSW-81-3, ATA, Inc., 1981.

= .000129 x 120,000 miles/yr. per truck/trailer

= $15.48 per truck/trailer per year

15.48 x 356,700 vehicles = $5,521,716

For 3: Loss of revenue is also based on Murphy.

$$\$S = CPM \times M \times T/100 \times L \times \frac{\left(1 - \frac{ROI}{100} - \frac{IR}{100} \times P\right)}{PL}$$

Where:

$S = dollars saved per vehicle

CPM = cost to operate vehicle, $/mile =

1.068 in 1980 + 30% inflation = 1.388[17]

M = Annual Mileage

T = Percent of Trips @ Full Gross Weight (Murphy 8%, Taylor & Ludke, 6%. Use 6% to be conservative).

L = Useful Life = 5 years (conservative)

ROI = Return on Investment = 20% after Murphy.

IR = Interest Rate = 10%

P = Weight saved, lbs. = 58.51 lb.

PL = Payload (50,000 lb., Murphy: 47,500 Taylor & Ludke (use 50,000 to be conservative)

$S = $\frac{1.388 \times 120{,}000 \times .06 \times 5 \times (1-.20-.10)\ 58.5}{}$ = 40.93

40.93 x 356,700 vehicles = 14,599,731

For 4: Operating costs (accounts for maintenance, repairs to guard and/or frame, replacement of guards damaged beyond repair).

356,700 x 425.00 = $156,519,600

TOTAL first year cost = $252,939,177

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17 Ibid.

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